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1961 — The Short Hog Cycle?

From 1952 through 1959 the swine industry experienced two definite hog cycles. For two and one-half years the price went up and then for a year and one-half it went down. In general, the high price for the year occurred later in the year on the way up and earlier in the year on the way down.

Since release of the December USDA pig crop report economists are wondering: Are we in for a "short hog cycle"?

Basically, the report said that although for the total period from June through November producers farrowed three percent less sows than the year before, for the last two months (October and November) they farrowed more than the year before. And furthermore, that they intended to farrow four percent more sows this spring of 1961 than they did the previous year. This is quite different from what occurred the previous two cycles and indicates a short "upswing" in the hog cycle.

Prices of market hogs in 1961 will be determined basically by three things: (1) the amount of money consumers have to spend; (2) the amount of pork on the market, which includes current slaughter plus storage, and (3) prices of other meats on the market.

In light of consumer demand, sows farrowed, expected slaughter, and the competition from other meats, it appears that prices will c o n t i n u e at high levels through June of 1961 — and stay above prices the same month of 1960. Barrow and gilt prices at eight markets are expected to climb to an average monthly high of near $18.00 in June.

After June the picture is less certain. If the 4 percent increase in sows farrowed is realized, prices will probably drop below 1960 levels for the last half of the year, averageing $14.00 to $16.00 in December 1961.

—*Agricultural Banker*

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Editor and Publisher — Hugh Highsmith
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ADVISORY EDITORIAL STAFF
William A. Albrecht, Chairman
Department of Soils, U. of Mo.
G. B. Gunlogson, Agricultural Engineer
T. J. Rutherford, Chairman, Canadian Farm Credit Corporation
W. T. Spanton, Chief of United States Ag. Education Service.

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The Farmer's Digest

Volume 24 March, 1961 Number 9

Let's Come Down To Earth In Dairy Sales Goals!

Reason and not emotion, says the author, should guide us. Here he sharply challenges those who criticize dairymen for their selling effort. The views expressed are the author's own and not necessarily those of A. D. A. . . .

Condensed from Hoard's Dairyman

Frank R. Neu, Director of Public Relations, American Dairy Association

FARMERS are going to have to realize there is a limit to the amount of milk and other dairy foods people can consume, even though milk may be "nature's most nearly perfect food."

For years now we, in the dairy industry have been living with some consumption or sales goals that are based on failure to face reality. There has been a constant plague of after-dinner speakers and others to tell us we are a bunch of incompetents who ought to be ashamed to face our children because of the miserable job we're supposed to have been doing in selling dairy products.

What are the facts? This we must try to find out if we are going to develop reasonable sales goals for the years ahead.

No matter in what perspective you might prefer to view the dairy industry sales record today, it would be dishonest to suggest anything other than that the industry has done a pretty terrific selling job through the years.

Consumers in the United States alone spend over $10 billion per year to buy dairy foods. Each per-

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son, on the average, now consumes the equivalent of almost 700 pounds of milk each year. This means — on the average, of course — that all of us fill our stomachs at least once each day with milk products.

Let's look at some of the arguments of those who suggest we in dairying have not done a good sales job.

It might be true that demand for dairy foods would increase considerably if those who are not now consuming enough milk would do so while all other people made no change in their present consumption patterns. But, if we are going to use the recommendations of nutritionists, we had better learn what they are.

What Nutritionists Recommend

It is generally agreed by nutritionists that adults, except for ill or pregnant women, do quite well on two cups of milk per day or its equivalent in other dairy foods. This is based on the assumption that milk is consumed as part of a well-balanced diet. It is important to note the recommendation is for milk or its equivalent in other dairy foods, not milk plus other products. Two cups of milk per day amounts to 365 pounds of milk per year, a good deal less than our present 700 pounds average.

It is qiute possible there are groups in our population who do not consume the recommended amount of milk or equivalent. These people do provide some challenges to our sales ability.

We must keep in mind, however, there is a growing trend among people to be more concerned about eating to maintain good health. It is always possible any sales gains we make in one area may be offset by reduced consumption by those who today are eating considerably more than recommended by nutritionists. In setting sales goals, we would do well to strive for a balancing among these groups.

The Irish Contrast

Another favorite club frequently used by those who try to prove we aren't so hot as salesmen is citing statistics on per capita milk consumption around the world. We are supposed to be ashamed of ourselves as salesmen because, on a milk equivalent basis, the Irish consume more than twice as much milk as we do. As a matter of fact, we, as a nation, rank 15th in milk consumption. This often is misinterpreted to suggest we are malnourished or undernourished because we consume 700 pounds of milk per person instead of 1,000 or 1,500.

Until you know what the pitch is, don't buy anything for a song.

Here, again, it is unreasonable to punish ourselves this way. In this country, milk must compete with thousands of other food items not available in many of these other countries. Our high meat consumption, for example, offsets the very high cheese consumption of many European countries. It is doubtful if the American people would willingly change from their huge variety of foods to a diet of potatoes and butter, no matter how delicious the potatoes become when butter is added.

Keep in mind nutritionists recommend two cups of milk or its equivalent per day for adults to provide all the milk nutrients needed for good health. Additional milk in the diet is valuable only if it is consumed after eating other types of foods which provide essential nutrients not present in milk.

The best way to double your money is to fold it once and put it back in your pocket.

Two cups of milk provide the nutrients we need from milk. It is wrong to assume because two cups of milk are healthy, four cups would be twice as healthy. There are cases of malnourishment among children where milk consumption is so heavy that other foods are not included in the diet in adequate amounts.

Milk, we must always remember, is not a perfect food. True, it is a tremendously valuable collection of necessary food nutrients, and its value increases in the well-balanced diet.

Most dairy foods are comparatively high in calories. An 8-ounce cup of milk supplies 165 calories. Two cups would provide over 10 per cent of the total calories (3,200) needed by a 25-year-old man engaged in at least moderate physical activity. For a 25-year-old woman, two cups of milk provide about 14 per cent of her total daily calorie needs.

Give Up Steaks?

Obviously, people whose need for calories has steadily decreased as machines are substituted for human labor, will not trade their steaks and chickens, ham and eggs, fruits and vegetables, and pastries for more milk.

Nor is it reasonable to assume, under the present status of human frailty, that we will exchange beer and pretzels, martinis and canapes, for an extra glass of milk, no matter how much better the choice might be from every reasonable viewpoint!

Gradually we will see more changes in the diets of the American people as efforts are made to fight the No. 1 health problem — overweight. We become over-

weight by eating more food than needed for our energy use. It's estimated that over 35 million people are overweight, and this problem is getting more attention.

Fat is being de-emphasized. Some fat is essential in the diet, but most nutritionists and medical authorities believe we eat far too much. People are being urged to reduce fat consumption by one-third, on the average.

Cow vs. Vegetable Fat

This de-emphasis on fat leads us in dairying to a problem we must face realistically, not emotionally. From the consumer point of view and on the basis of all factors which usually affect pricing, butterfat today is overpriced.

There is in the world, not just in America, an excess supply of edible fats at a time when people are being urged to reduce fat consumption as a health-improving measure. It has been pretty well established in this country that many people are not willing to pay a premium for fat because it happens to come from a cow instead of from a vegetable.

The difference in consumer purchases of butter and oleomargarine are much more significant than a surface look indicates. When the homemaker is spending her own grocery money, she buys far more oleo than butter. The use of butter in restaurants and institutions does much to keep the consumption of the two products close together on a per capita basis.

We need less fat because we do less physical labor. Fat was more important in the days when most of us walked behind the plow all day or cut wood without power saws!

The per capita consumption of butterfat has been d e c l i n i n g steadily over a long period. Actually, the loss in per capita sales of butter is itself a major factor to be considered in assessing our sales position today.

During the past 20 years increases in per capita use of fluid milk, nonfat dry milk cottage cheese, other cheeses, and ice cream have offset a large part of the loss due to less butter consumption. Our industry should be proud of having recouped so much of the loss, rather than hanging our heads in shame because we lost some market in a battle that had most of the odds stacked heavily against us.

The decline in the horse population from 25 million in 1920 to less than 5 million now has released more than 45 million acres of land that were formerly needed for growing horse food.

There is another very impor-

tant factor which must be realistically considered today in setting reasonable sales goals.

It is no secret that butterfat has been under suspicion, along with other animal fats and hydrogenated vegetable oils, in the heart disease controversy.

A great deal of research is being conducted to find the cause of heart disease. Some research results seem to be helpful in removing dietary fat as a cause. But, as of now, there is enough doubt about fats in the diet in the minds of many prominent medical authorities to give the dairy industry trouble.

Although average farm size is rising, a USDA report shows there has been no substantial increase in concentration of ownership since World War II. Individuals still own 96 per cent of the cropland, with 49 per cent of farm and ranch lands owned by husband and wife combinations.

To Erase Doubts

Milk and milk products will continue to receive the support of nutritionists and medical people because of the tremendous contribution they make at very low cost. However, we cannot forget that doubts have been raised, doubts which eventually will be removed only through competent research that often takes many years to come to generally accepted conclusions.

We likely will have to live with the fat-heart disease problems for some time to come. It will continue to have some adverse effect on sales.

While every possible effort must be expended to tell the story of milk's vital role in providing the basis of a good diet for American people, we should not forget that greed breeds contempt. Milk is a tremendous bargain nutritionally and dollarwise as part of the well-balanced diet. We should not expect people to try to live on milk alone, however. Milk is used almost universally in American homes as the basic food. On the average, per capita consumption is relatively high.

Cannot Be All Things

Any effort to break down this public picture of milk as our basic food will result in damage to sales in the long run. The hue and cry to make milk a "socially acceptable" beverage to compete with coffee, tea, and soft drinks seems to be a waste of time and effort, as well as destroying the image which earlier generations of milkmen built up!

It is obvious milk cannot be all things to all people. It cannot be looked upon as both a very im-

portant food product needed in the daily diet and a frivolous drink to be consumed at parties for example. A basic food is consumed more frequently and in greater quantity than a party food.

To think clearly about reasonable sales goals for milk and other dairy foods, we must get over the habit of believing consumers ought to buy whatever farms produce.

First, we must recognize most of our population is consuming milk and other dairy foods at a high level when rated against the many different foods available and our total need for food.

Because we are enjoying fairly high sales levels does not mean we should sit back and rest. The competition for food dollars is increasing steadily. Today it is a tremendous job to simply hold one's share of the market. The support which dairymen give to the American Dairy Association, National Dairy Council, and other local, state, and national programs will have to increase simply if we are to hold what we have.

Speaking Bluntly

We must realistically face some very serious problems, a few of which we have touched on above. Now let's speak bluntly about our situation.

In some states today it is legal to sell "filled milk," which is a combination of cheap vegetable oils and skim milk. Highly capable food technologists are able to perform near-miracles in their laboratories these days. The chief reason skim milk is used in substitute products is because it is cheaper than producing a completely synthetic product. But such a completely synthetic milk could be produced if incentive warranted it.

This, in effect, is another way of saying attempts to improve the financial position of dairymen by raising to excessively high levels the price of milk for Class I might produce the financial incentive to encourage completely synthetic substitutes for milk.

The wealthy of India greased the wheels of wedding chariots with butter, believing that the free-wheeling qualities of the chariot would continue to mark the marriage and cause it to run forever smoothly.

It may well be that improved milk prices may have to come as a result of a growing demand for manufactured products rather than through higher fluid milk prices. Higher fluid milk prices not only might encourage substitutes, but the possibility of further expansion of fluid milk consump-

tion probably is not as great as for some other milk products, such as cheeses and low-fat desserts.

Of course, increasing population will expand the fluid milk market if we hold present per capita levels. We could strengthen our position by treating at least some manufactured dairy products with more respect than they receive today from some segments of the dairy industry.

Milk is going to continue to be important in the American diet. Dairymen, however, might well consider facing the facts of life as they exist. We are not lagging in salesmanship. We are doing mighty well considering the competition we must meet.

Fertilizer Price Increases Expected During Coming Year

Increased costs of materials and labor will probably force commercial fertilizer companies to raise their prices for the 1961 crop season.

Paul N. Mosher, crops specialist for the University of Maine, expects moderate increases in fertilizer prices. He feels that farmers should be prepared for these price increases and understand the reasons behind them.

First of all, cost increases have been made during the past year on the various forms of nitrogen. Nitrogen solutions constitute the most important sources of nitrogen in manufactured fertilizers today. The price of nitrogen solutions has advanced 3.12 percent in a year.

Secondly, the cost of phosphate rock used in superphosphate has increased about 6 to 7 percent in a year. This is largely caused by increased labor costs at the phosphate rock mines.

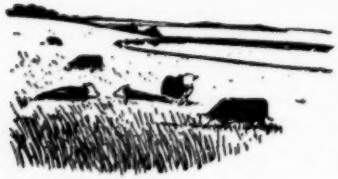
At the points of production, the cost of muriate of potash has advanced some 9.5 percent in the last year. Also, some rail rates have advanced slightly, but manufacturers do not consider this a serious cost factor as yet.

Within the past 12 months, the cost of multiwall paper bags has advanced 8 percent. Increased labor costs are responsible.

In the case of one major fertilizer company, labor costs have increased 6 percent during the last year. This is rather general throughout the fertilizer industry. Mosher says that most fertilizer companies doing business promise to hold the price increases to the lowest possible level. However, growers must expect moderate increased costs.

—University of Maine

Use of Records In Commercial Cattle



Good beef cattle management in commercial herds starts with good records. Here are the kinds of records to keep and how to use them . . .

Condensed from Texas Livestock Journal

Dale Engler, Manager, Ramsey Ranch, Burns, Kansas

WHEN we think of records in commercial cattle production most of us probably think of production costs, feed records, or something of that nature.

Although we use some records of this kind, the records I want to discuss with you are production and breeding records as we use them in a commercial operation producing feeder calves.

What are production records? To me production or performance records are the measuring and recording of production traits of cattle and using these records as a basis for selecting cattle with the greatest production potential through their genetic make-up. These records may be weaning weights, scores on conformation and quality, or feed lot gains. Part of the differences between individuals are due to inherited capabilities. These differences offer opportunity for herd improvement.

According to an Oklahoma State University study there is no antagonism between gaining ability and type. To me that is an important statement and one that from observation of six years' work I can agree with, without reservation. You have undoubtedly heard the statement many times that selecting cattle by the scales is likely to result in big, coarse cattle that will not finish at an early age or a desirable weight. This is possibly true if we do not use type or conformation scores and give them equal emphasis with weight, but by using the two together we can certainly get high gaining cattle of the right type.

To do production testing for these traits requires: (1) Positive identification of animals, (2) a livestock scale for obtaining individual weights, and (3) a scoring system for conformation and quality.

For feeder calf production our goal is a cow herd producing

Reprinted by permission from Texas Livestock Journal, P.O. Box 1469, San Antonio, Texas

heavy, top-quality calves that will go to the feeder and make efficient, economical gains for him and produce a carcass the consumer of today wants.

There are several methods of identifying cows. We find the most satisfactory method for us is the use of brand numbers on the cows. Calves are identified with an ear tag that corresponds to the brand number of the cow. The calves are identified as they drop and we feel that the man who does this work more than pays for himself through the extra calves saved due to being a little more alert at calving time. A record is kept of birth date and sex at this time.

At weaning time we obtain the weaning weights and grades of the calves and compare them. In order for comparisons to be fair, factors which influence weaning weights, such as age of calf, sex of calf and age of cow, should be considered. These factors can be adjusted for by using information obtained from experimental herds to standardize the weights.

For instance, take the difference in age of the calves. We use 210 days because we wean our calves near that age. We use a chart developed by Oklahoma State University for this factor. The chart was developed from the following formula — weaning weight of the calf times 296, divided by age in calf in days plus 86.

The difference in the weights of steers and heifers can be taken care of by adding 25 pounds to the weight of the heifers.

Effect of Cow's Age

The age of the cow is important and we have found that the standards generally used do not fit our cows as well as they could. Most standards say that the production of a cow increases steadily up to six years of age and then declines. We find that production of our Angus cows increases up to six years, then holds about steady to ten years. Therefore we use the following corrections for age of cow: two year olds, add 90 pounds; three year olds, add 55 pounds; four and five year olds, add 30 pounds; 6, 7, 8, 9, 10, nothing; and 11 year olds add 10 pounds.

Great minds have purposes; others have wishes. —Washington Irving.

After all of these factors have been applied you can compare all calves corrected to a basis of steer calves out of cows that have reached maximum production. Records should be used only to compare production of cows or bulls within your own herd and not between herds because of the

differences in feed and environment.

We have found that the easiest and best way to keep records on a large number of cows is through the use of IBM records. The cost has not been high as the records we have on the performance of 3,939 cows over a six year period has been 27 cents per cow record. Through the use of IBM records you can get about any kind of information you desire providing it is punched on the IBM card to start with.

We also keep all our breeding records on IBM and find that this practice enables us to have information that helps a great deal in management of the cow herd.

For instance, we have a chronological list made up by IBM listing the cows in the order they are due to calve. From this list we sort cows into bunches of 100 head so that we do not have to watch 750 cows at calving time but only about 100 head. Another thing we get from these records are the slow breeders. This is another trait which probably is inherited to a certain extent, so we cull those cows.

Some people may be sitting on top of the world, but most of them arrived there standing up.

Increasing Calf Weights

We started keeping performance records in 1954 and now we have records for six years on our cow herd of around 750 cows. To show what progress can be made, I would like to quote you some figures on this herd of cows. The grade of the calves produced has gone from 31% Grade 1 in 1954 to 35% in 1955; 50% in 1956; 77% in 1957; 81% in 1958 and 90% in 1959. A Grade 1 calf is what we would all call high choice or fancy. At the same time the Grade 3 or what we would call a good grade calf has decreased from 12% in 1954 to .2 of 1% in 1959.

The weaning weight increased from 421 pounds in 1954 to 489 pounds in 1959. The adjusted weaning weight at 210 days of age has increased from 461 pounds in 1954 to 487 pounds in 1959.

There has been a difference in production of cows from under 300 pounds to over 600 pounds on the basis of a 210 day adjusted weaning weight. Although a cow's production over the years stays fairly constant, variations in adjusted weaning weight do occur. Apparently this is due to feed conditions and the bull she is bred to.

Most people generally think that milk production has more influence on the weaning weight

of the calf than any other factor. I will agree with this to a certain extent, but since we have been able to get some records on individual bulls, I am convinced the bull has more influence on calf weaning weight than most of us realize. For example, in a cross section of our cow herd in 1959 we had a variation of from 452 pounds weaning weight to 533 pounds on an adjusted basis between calves by different bulls. This is more than enough to be concerned about. As would be expected, the quality or grade of calves by different bulls varies considerably.

Using Production Records

How can these records be used? For the selection of replacement heifers, I would like to emphasize again that you can get correct type and quality along with gainability. We like to grade our calves before they are weighed and let the scales find the poor gaining calves. I believe you should select 10 to 15 percent more replacement heifers than you need and put a lot of emphasis on conformation. Replacements also should be top weighing heifers. If they are heavy they'll be from good milking cows.

Winter the heifers under the usual conditions, whether it's with grass and cake, or on silage. If you are breeding to calve as two year olds, reweigh the next spring. If as three year olds, wait till the next winter and take off the 10 or 15 percent extra which show the least gain. Another observation I would make is this: The best doing calves will probably not be the best looking cows, due to the fact that the cow which is working the hardest will not carry as much condition as the cow which is not working quite so hard.

You can use records to cull the low producing cows. We culled our cow herd one time while flying from Wichita to Chicago to see the steers in a feedlot which we had sold the year before. It is a lot easier to sell some of those good looking cows which haven't been doing much work when you have her record to back you up. Let me say also that after a couple of years of record keeping, you will have culled out the poor producing cows. Another thing you will find is the poor mothering ability of some cows. Some cows which have a calf every year don't raise one every year. Cows which have lost one calf tend to lose another one. Therefore, I believe all dry cows should go to town.

The man who gives much is richer than the man who has much.

Herd Bull Management

Much has been written and said on the subject of herd bull management. I don't want to go into a lot of items on selection except to say that we want to use bulls in our herd which are performance tested. We want both a high weaning weight and a high feed test gain along with correct type. We feel that research work done indicates that a bull which passes these requirements stands a better chance of siring calves which will weigh more at weaning, gain more in the feedlot and be of a desirable type and quality. We prefer to use half-brothers if possible, to maintain and strengthen uniformity in our calf crop. I don't believe you can get bulls too good to go on commercial cows, although I have had registered breeders tell me that this or that bull was too good to go on commercial cows and should be used on registered cows. He may be too high priced to use, but certainly he won't be too good.

We don't like fat bulls or bulls that spend all their time in a small lot before we get them. If a bull is going to do a good job he must have good feet and legs. There is no excuse for the use of unsound bulls. During the off season we like to keep bulls on the range and find that oats is about the best grain to keep them in good breeding condition.

I believe pregnancy checking cows each year and selling all non-pregnant and dry cows will increase the breeding efficiency of a commercial cow herd considerably. We have less than two percent of our cows which fail to get with calf, but this has taken a lot of strict culling.

Since we are doing some artificial breeding we have been able to get a progeny check on a lot of bulls and to do some culling on that basis, too.

In summary I would like to emphasize that production records should not be used to compare cattle between herds but only within the herd where the testing is done. It is not a cure-all for beef production, but only another tool we can use for more profitable beef production.

Many sources which have supplied safe, pure water for long periods can suddenly become contaminated or objectionable. Pure water is the most important single commodity on the farm. It affects the health of family and livestock. Periodic checks and tests should be made of any water supply, regardless of source, if water-borne disease and other undesirable traits are to be avoided. Your local health unit will make a check of any approved water source.

Best Way To Make An Extra $1,000

Take a tip from this University of Illinois study. It tells you how . . .

Condensed from Farm Journal

LET'S say that you want to add $1,000 to your farm income, above costs. What's the best way to do it?

The guide at the end of this article shows how many units you'll need, how much labor and how much annual investment for each of the different enterprises. With it, you can decide which enterprise is best adapted to your situation.

For instance, if you're short of labor, you'd pick something like steer calves in the livestock line. But if you're short of cash and credit, you'd stay away from beef and stick with hogs.

The chart assumes average prices, costs and management ability, and is based on farm records from the University of Illinois.

If you're especially short of help, time and investment money, renting more land may be your best bet. Custom work would fit in well—if it doesn't conflict with your own farm work.

The shortage of good hired labor explains why the shift to bigger farms in the Corn Belt emphasizes more corn, beef and hogs. It shows, too, why poultry and dairy are losing out on Corn Belt farms.

"If we can afford to spend billions of dollars developing the resources of foreign countries, surely we can afford to spend a few million dollars in conserving the resources of our own." —Sen. Richard B. Russell of Georgia in Tuesday Letter.

Remember that the figures in the table below are averages. You might be able to do considerably better if you're a good manager.

Reprinted by permission from Farm Journal, Philadelphia 5, Pennsylvania

SHORT CUT TO FIGURING VOLUME

Units of farming enterprise needed to add $1,000 income over direct costs

Number of units needed	Kind of enterprise	Direct labor-hours needed	Direct annual capital needed
5	Dairy—10,000-lb. cows; Grade A Market	625	$ 2,000
7	Dairy—8,500-lb. cows; Grade B Market	875	$ 2,156
20	Beef herd—calves sold	600	$ 5,200
29	Steer calves—pasture-fed	406	$ 5,655
62	2-yr.-old steers—drylot-fed	558	$15,996
10	Sows—two litters per year	450	$ 2,350
800	Commercial laying flock	800	$ 1,800
50	Acres of good land rented—75% row crop	250	$ 670
75	Acres of fair land rented—50% row crop	375	$ 710
550	Acres—custom combining, 12-foot self-propelled	210	$ None

"Super Farms" Need "Highly Skilled" Managers

Highly skilled farm managers are necessary for economically sound "1000-acre super farms," says Raymond Beneke, farm economist at Iowa State University.

Results of a survey conducted by Beneke comparing farms of about 160, 320, 500 and 1,000 acres show that the average 1,000-acre farm had higher labor and machinery costs per $100 of crops produced than did the 300-acre farms.

Beneke did find that best operators of the 1,000-acre farms could achieve lower costs than the best operators of the medium to small farms. Large-scale farming permits a highly skilled manager to fully use his talents, concluded Beneke.

Beneke pointed out that large-scale farming invites more and costlier mistakes if the manager has to spread his supervision over too large an area. He also discovered as he analyzed the "super farm" reports that the operators who had difficulty in holding down machine costs also had difficulty in making efficient use of labor. In spite of increased use of high-capacity machinery, an average of 4 man-hours per rotated acre were needed on the 1,000-acre farms. Only 3.4 hours were required on the 500-acre farms.

The average 1,000-acre farm had lower per-acre crop yields than the medium to small farms. Beneke believed this was due to the attempts of the large operators to "cut corners." They generally plowed under the fertilizer and cultivated row crops only twice.

—Iowa State University

At What Time Should You Wean Pigs?

The following are some conclusions compiled on this subject. Early and late weaning are compared . . .

Condensed from The Poland China World

THERE are several plans in existence for weaning time for pigs. Each of these plans is explained below and the advantages listed.

Seven to Ten Day Weaning

Formulas have been worked out so that pigs can be successfully weaned at seven to 10 days of age. Theoretically, weaning at this age has a number of advantages. That is—produce heavier pigs at eight weeks with fewer runts; eat starter rations earlier; realize better control of anemia and scours; sow's feed costs are lower; less housing space required; more pigs saved from being crushed by the sow; and the possibility of getting the sow bred back sooner or shortening up the farrowing cycle.

Early weaning at this age, however, has some limitations: it requires expensive highly fortified, palatable starters; it requires excellent management—pigs cannot be neglected; they must be kept comfortable with a constant supply of feed and water; it requires better-than-average equipment; and it is best to feed pigs in groups of not more than 10 to 15. At least six to eight square feet of floor space should be provided pigs until they are four to five weeks old.

Raising week-old pigs is much like brooding baby chicks. Drafts should be avoided. They should be started at a temperature of 80° F., five inches above the bedding. Temperature can be lowered five degrees per week until 60° F., is reached.

Twenty-eight Day Weaning

A number of nutritionists have reached the conclusion that it is impractical to wean pigs at a time earlier than three weeks. Weaning from three to five weeks-of-age combines many advantages of earlier weaning plus taking advantage of the sow's milk during the heavy flow—during the first four to five weeks.

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Between one and three weeks-of-age, a pig's feed requirements change greatly. At this age the pig is hardier and easier to manage than a less hardy seven day-old pig. Therefore, management requirements are not too different than the requirements of pigs weaned at eight weeks. However, the pig still needs a highly fortified pig starter.

When weaning pigs at four weeks, sort them out according to size. Do not put more than 20 pigs in one pen. Allow at least six to eight square feet of floor space per pig. Pigs need good housing, equipment and management, but no better than that which is required for raising pigs on the sows. Use solid pen partition and prevent floor drafts—keep dry, do not overcrowd.

Fifty-six Day Weaning

Many pigs are still left on sows until they are seven to eight weeks or older. One of the big reasons for this is that many farmers have limited farrowing facilities and many still run three to five or more sows and litters together on pasture at least a part of the year. This practice will continue on many hog farms for some time because farmers are used to this program and it fits their equipment and experience. Also, the extra pig losses are at least partly offset by lower overhead expenses and lower labor requirements under certain farm conditions.

Economics of Early Weaning

Results of tests comparing feed costs or gains from weaning at one, three, five and eight weeks leave some doubt as to the economics of early weaning. From the scattered work that has been done, there appears to be little difference in total feed costs regardless of weaning age.

Earlier weaning will be more attractive from a feed cost standpoint if and when pre-starters and starters are less complicated and expensive.

Palatability

The importance of palatability is probably over-magnified. A normal, healthy pig should be glad to eat a combination of any accepted ingredients. However, companies merchandising pig pre-starters and starters are constantly reminded of the importance of the product that pigs will eat early and will eat readily.

Keep animals away from wet paint. They have the annoying habit of licking the paint and may die of lead poisoning from it.

It is difficult to appraise palatability of a pig starter in the field because habits and health

of the sow, and intelligence and herdsmanship on the part of the feeder may over-shadow small variations in palatability of feed. Pigs getting plenty of sow's milk are often two weeks old before they care for feed. Anemic pigs and pigs sick from chronic erysipelas or with lung and intestinal infections have poor appetites. This increases the difficulty in evaluating palatability of a starter in the field. Another perplexing observation is that pigs will eat a theoretically less palatable feed mixture from their mother's trough or feeder and let the tasty pre-starter go.

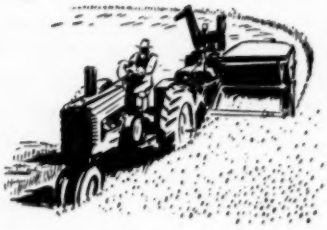
Some investigators believe in the principle that a starter cannot be too good. However, much simpler and just as effective pre-starters as those generally used today will probably be made. Palatability and the use of rather expensive ingredients are over-emphasized because of the psychological advantage realized by popularization of this information in the trade press. The performance obtained from properly fortified corn-soy diets for even healthy two to three week-old pigs have been good.

Considerable field experience might suggest that the continuance of extra fortification, generation after generation, may lead to less hardy pigs. It is entirely possible, through the use of simpler rations and limited feeding, to develop strains of hogs and feeding practices that are more efficient than those in use today. Contrary to some previously held ideas, there is beginning to be some indication that including some fibrous feeds or other-wise limiting the total feed to young pigs may condition them to better utilization of less expensive feeds later.

In general, the emphasis seems to have been more expense and less time. It is entirely possible that there are some contributions to be made in working toward less expensive feeds along with some practices that may actually produce a superior market hog with less total cost and with very little more time. The place to start might possibly be with pig starters and with baby and weanling pig management.

More people are living in the world today than have died since Adam, according to Dr. M. H. Taves of the University of Minnesota. He says that three-fifths of all the people ever born are now alive. Whether one can confirm or deny his figures, the boom in world population presages an ever increasing role for agriculture. The really basic problem of the world is agricultural—to produce enough food.

Should You Rent Equipment?



Renting equipment may fit your farm operation under certain situations. This article tells how much rent to pay . . .

Condensed from
Western Crops and Farm Management

Tom Claque

WHETHER or not you should rent farm equipment obviously depends on whether it will be more profitable to rent than to own the machinery. And this depends upon a lot of factors.

Maybe you're behind in your work, and need some equipment for a week to "catch up." Maybe you need the equipment to try some new practice, and you don't know if you want to invest permanently . . . so you try the practice for one season with rented equipment. Maybe at the moment your capital position makes it easier to rent than to buy and get your cash tied up.

For a multitude of reasons, people are renting farm machinery, and there shouldn't be any reason why renting won't work in the above cases — it works for all sorts of things, from small tools to automobiles, trucks, heavy equipment, and buildings. During your 1961 cropping season, you'll want to consider this method of getting equipment use.

Rental Rates

Renting is recognized by the farm equipment industry, as indicated by the fact that the Farm Equipment Retailers' Association has recommended a schedule of prices for dealers to use in conducting their rental business. If your local dealer is renting equipment, he may use it . . . or he may not. But if he's a good, sound dealer, he'll probably be aware of it. Here it is:

One day 1% of new delivered price.
One week 5%
One month 15%
Two months 25%.
Three months 33⅓%.

At first glance, some of these rates might seem high. But the key to the matter is not how high the rates are. The rates must be established high enough to allow

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the dealer to provide you with this service . . . or he'll be forced to discontinue it.

'Key To The Matter'

Rather, the key to the matter of renting is whether it is better business for you to pay perhaps $180 rental for a unit during a busy season, or to buy it and then spend $380 every year for ten years, in depreciation and interest. If you put the difference between the annual cost of ownership and the rental charges to a more profitable use—and if you can do the work with the rented machines satisfactorily — then it is probably good business to rent. Actually, of course, the economics of any given situation would determine the decision.

As a matter of fact, economists suggest that you can afford to pay up to 20% of the price of new equipment, annually, in rentals, and do so profitably. This would be perhaps six weeks' use for the equipment, according to the schedule. If you need the equipment for a longer time than this, you can probably better afford to own it yourself.

Now, suppose you're able to decide that renting is good business for you, for a particular situation. What do you do? You find a dealer who has a rental program, and you work out the deal. Since he will have his system "already going," it is not really your place to rewrite his terms. It's up to the dealer to decide what he can afford to offer you, and up to you to decide if you can afford his price. This is not quite the same as dickering on a trade.

Details

Then be sure to get all the details ironed out. Do you pick up the equipment and return it — or does he deliver and pick it up? Exactly when does the rental period start and end? Who pays for damage and wear? What is "normal wear and tear?" What if it rains and you can't use the equipment? Do you pay, or does he "stop the clock for you" when the weather is bad and you can't do any work? What does he furnish in the way of supplies? What do you furnish?

All known mammals have 2 sets of teeth, like humans.

If you do decide to rent, then it's more important than ever that you manage very carefully to make the most of your investment. Have everything ready to go, and planned out, so that every dollar you spend gives you a good dollar's worth of work done.

Advance Planning

Another thing to remember is that the availability of equipment may vary a great deal, depending

upon the dealer's situation, and the demand for his rental machines. So if you plan to use rental equipment, it would be well to plan as far ahead with your dealer as possible.

In addition to letting you "catch up," or try a new practice or crop, renting also offers the opportunity for you to try equipment on a more thorough basis than is possible during a short demonstration of an hour or so.

Whether or not renting is good for you depends upon your situation, and whether you can find a dealer who can take care of you. But it is quite possible that it might fit well, some place, in your operation.

Soil Testing Samples

Even soils which appear uniform have variations in fertility levels resulting from past management, cropping, fertilizing and liming. Roy D. Bronson, Purdue University agronomist, says the aim of testing the soil is to detect differences in order to utilize fertilizer and lime with greater efficiency.

Bronson warns farmers that one composite soil sample should not cover more than 10 acres, and if farmers follow this practice, it will greatly increase the value of soil test recommendations.

"Our recommendations are aimed toward supplying nutrients for crops grown on soil of the type represented in the sample," Bronson says. "When too large an area is represented by one sample, the result is often a mixture of soil which does not closely correspond to any part of the field. Therefore, it can not be truly representative. Lime and fertilizer treatments based on such soil samples will not fit the field because the sample does not tell the truth about the field."

Bronson says samples taken according to soil types on areas of 10 acres or less will show location of fertility differences. Armed with this type of specific information, the farmer can take steps to correct the soil deficiencies.

Since the largest source of error in soil testing is in the sample, the extra time spent in taking samples from smaller areas is well worthwhile, Bronson adds. And, if there is a limitation because of time and weather, a farmer is farther ahead to do the detailed job of sampling on two or three fields than to try to cover the entire farm.

—Indiana Agricultural Extension Service

Careful Attention At Lambing Time

Good lambing time care is the key to profits in the sheep enterprise . . .

Condensed from Wisconsin Agriculturist

INTERESTED in cutting your lambing losses to a minimum? Five words supply the answer—c a r e f u l attention at lambing time. This can help you keep loss well below the 25 to 30 percent that occurs in many flocks.

Neglect is the number one reason for lambing losses within a week after they are dropped. Most flock owners know what to do at lambing time, but knowing and still neglecting to do it does not save lambs.

Be Ready To Help

So don't fail to keep close tab on ewes when lambing time starts. You need to be on hand to transfer ewes to lambing pens, help in delivery and to see that lambs nurse soon after they are dropped.

Pregnant ewes may be shorn just before lambing if adequate shelter is available, but they must be handled carefully. This helps because a shorn ewe will keep her lambs in the barn away from cold, rainy weather. Also, the lambs can nurse easier and ewes are less likely to crowd or smother their lambs.

If you don't shear, clip loose or dirty locks of wood from the ewe's udder and rear. This helps the lamb to nurse successfully and prevents disease.

Don't disturb ewes that show signs of delivery unless lambs aren't delivered within two or three hours after labor starts. Otherwise, make plans to help the ewe deliver the lamb.

Failure of the lamb to emerge when the ewe strains indicates trouble. If you don't have previous experience, get help from someone who knows how, or a veterinarian.

As soon as the lamb is born, remove mucus from mouth and nostrils. Disinfect the lamb's navel with iodine. Then put it with its mother in a lambing pen in a warm part of the barn.

Heat lamps are helpful in cold weather. Suspend an infra-red heat lamp over the corner of the pen to aid in drying, and to keep

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lambs from chilling. Hang the lamp 2 feet above bedding and protect it with several boards.

Usually the lamb will be trying to nurse within 30 minutes or an hour after birth. Baby lambs have little chance to live unless they get at least a few swallows of colostrum. Some ewes may have no milk when their lambs come, but it usually comes within a few hours.

When it's necessary to raise a lamb with a bottle, it should be fed about the same as a new-born baby. Cow's milk or diluted evaporated milk may be fed. Four ounces every three or four hours are sufficient. As the lamb grows, the amount of time between feedings should be increased.

Observe lambs closely during the first week for signs of constipation. Eight to 12 ounces of warm soapsuds enema introduced with a 4-ounce syringe will often bring quick relief. Follow up with 4 ounces of mineral oil by mouth to prevent the condition recurring.

Dock and castrate lambs at 3 to 10 days old. Both operations may be performed at the same time. Be sure to use a disinfectant solution, such as creoline. Handle the lamb quietly and lay it in another clean, well-bedded pen away from the ewes for a few hours.

Sterilize Instruments

For best results, use an emasculator for docking. Hold the lamb between the ankles in a standing position and pull the tail tight. Then snip it off an inch or more from the body. The emasculator crushes and cuts, and avoids any bleeding.

Castration is best accomplished with a pair of castration shears, or a knife or pliers. Before castrating or docking, instruments should be sterilized by boiling in water for 15 minutes.

When lambs are 10 days old, start feeding the ewes liberally, 1 to 2 pounds of grain daily, to provide plenty of milk for the lambs. If the ewes are not receiving legume hay or mixed hay, feed one-half to 1 pound of alfalfa pellets per ewe.

A general rule of good landscaping, for those who are in a position to choose their own trees, is to plant trees that will frame the house, giving it an air of spaciousness and stability. In choosing trees for this purpose, consider the angle and place from which the house is most likely to be seen. Usually this is from the view of the approaching visitor or passerby. Then plan your trees so the area in front of the house will be simple and uncluttered, and the surrounding trees will balance and frame the building.

The Road To Greener Pastures

500 pounds an acre of 12-12-12 gave an increase of 1947 pounds of dry matter per acre.

Condensed from Crops & Soils

C. J. Chapman, Soils Department,
University of Wisconsin

TOPDRESSING nitrogen fertilizer on pastures either in early spring or late fall, and backing it up with needed applications of phosphate and potash, will provide an abundance of high-quality feed for farm animals. This in turn will make possible greater yields of low-cost meat and milk.

Such fertilizer treatments will not only give farmers 7 to 10 days of earlier grazing, but will extend the grazing season into late July and may stimulate growth of native clovers during the fall.

Lush growth of fertilizer pastures will choke out many weeds, reduce grub damage, increase water-holding capacity of soil and slow down water runoff.

Too many of our pastures are little more than open exercising grounds for dairy herds. Cows that must hustle and rustle all day to fill their paunches are not going to convert much of their feed into milk or meat.

A dairy cow that can fill up in 2 hours on good pasture and then lie down in the shade to chew her cud for the next 2 hours, will come in at night with a pail full of milk for her owner.

The number one pasture program we recommend is renovation. This entails killing the old sod by tillage or chemicals, liming and fertilizing, and reseeding with adapted forage mixtures. It means fencing these pastures for 3 or 4 months while new seedlings are becoming established.

Dairymen who follow pasture renovation programs and do the job right will have four or five times as much feed the year following renovation as they would have normally obtained from a pasture not renovated.

Even renovated pastures will eventually "run out," with prairie Junegrass, timothy and brome taking over. Therefore, a regular fertilizer program is a must for profitable pastures.

The lack of nitrogen is more responsible for a poor pasture bottleneck than any other needed nutrient. There are thousands of acres of poor, yellow permanent

Reprinted by permission from Crops and Soils, 2702 Monroe Street, Madison 5, Wisconsin

grass pasture that are starving for nitrogen.

Evidence of this widespread lack of nitrogen in our permanent pastures can be seen in early spring where dark green splotches of rank-growing grass appear. These urine spots are good demonstrations of the lack of nitrogen.

Pasture improvement by direct fertilization is a program which is easy to carry out. All you need do is call a dealer on the telephone, order fertilizer, and tell him where to haul and spread it. Of course, you must pay for it, but it will pay for itself.

Many farmers have been literally astounded to see the tremendous response of pasture grasses to treatments of high nitrogen fertilizers, such as 10-10-10 or 16-8-8. Applied at 500 to 600 pounds per acre, yields have been doubled and sometimes trebled.

Over the past 10 years, several hundred acre-scale demonstrations using 10-10-10 or 12-12-12 have proved without question that it does pay to fertilize old pasture grasses.

More recently, I have come to believe that a 2 to 1 ratio of nitrogen to phosphate and potash best meets the needs of pasture grass on many silt and clay loam soils.

Thus 16-8-8, 15-10-10, or similar 2 to 1 ratios of nitrogen to phosphate and potash seems to be the best answer. During the past 3 years more than 100 acre-scale demonstrations have been set up in Wisconsin using these ratios. Average results for tests comparing 1:1:1 and 2:1:1 fertilizer ratios are shown in table 1.

All fertilizers were broadcasted in early spring on 1-acre strips running across the pasture. Dry matter (DM) yields were calculated as 30 percent of green weight. The value of the increased yield was figured at $50 per ton on the basis of 18 percent dairy feed, except where the pasture was mostly timothy and where the first clipping was made at the hay stage. In such cases the value of increase was figured at $25 per ton.

Table 1 — Comparison of 1:1:1 and 2:1:1 fertilizer ratios; spring broadcast.

Fertilizer rate per acre	Yield lbs. DM per acre	Increase lbs. per acre	Value of increase	Cost of fertilizer	Net profit per acre
174 acre-scale plots using 10-10-10 or 12-12-12, 1951-1958					
500 lbs.	6, 503	3,525	$88.12	$19.50	$68.62
None	2,978	—	—	—	—
74 acre-scale 16-8-8 or 15-10-10 plots, 1958-1960					
500 lbs.	6 964	3,672	$91.75	$21.00	$70.75
None	3, 292	—	—	—	—

Phosphate and potash are needed to back up nitrogen applications, too. This was proved conclusively by demonstrations carried out on grass pastures and timothy hay meadows in northern Wisconsin several years ago.

These tests, and similar ones in other states, shows that continuous use of straight nitrogen will soon deplete soil reserves of other major nutrients.

In northern Wisconsin trials, we found that applying ammonium nitrate on phosphate-potash deficient soils resulted in relatively small yield increases. Pastures on such soils turned dark green but made little extra growth.

However, when these nitrogen-treated plots were also treated with 0-20-0 or 0-20-20 fertilizer, yields were nearly trebled. Profits over and above fertilizer costs were more than double, as shown in table 2. Therefore, we urge a balanced plant food.

When applying 500 pounds of 16-8-8 per acre, you are actually supplying 80 pounds of nitrogen and 40 pounds each of phosphoric acid and potash.

To supply 80 pounds of nitrogen in the form of straight nitrogen materials would require 98 pounds of anhydrous ammonia (82-0-0); 177 pounds of urea (45-0-0); 195 pounds of solution nitrogen (41-0-0); 242 pounds of ammonium nitrate (33-0-0); 250 pounds of solution nitrogen (32-0-0); 320 pounds of aqua ammonia (25-0-0); or 381 pounds of ammonium sulphate or cyanamide (21-0-0).

The 40 pounds each of phosphoric acid and potash can be supplied by 200 pounds of 0-20-20. This could be applied at the rate of 400 pounds of 0-20-20 every other year.

Many farmers find that they actually save money by using straight materials, applied as bulk fertilizer by custom spreaders.

Table 2 — Comparison of straight nitrogen and balanced fertilizer having phosphorus and potash added; spring broadcast treatments.

Yield in lbs. DM per acre	Increase lbs. per acre	Value of increase	Cost of fertilizer*	Net profit per acre
	Ammonium nitrate (200 lbs./acre)			
3,289	1,429	$21.43	$ 9.00	$12.43
Ammonium nitrate (200 lbs./acre) plus 0-20-0 or 0-20-20 at 250 lbs./acre				
4,749	2,889	$43.33	$13.00	$30.33
	No fertilizer treatment			
1,860	—	—	—	—

* Ammonium nitrate figured at $90 per ton. The entire cost of ammonium nitrate, but only one-half the cost of 0-20-0 or 0-20-20 was charged to fertilizer treatment expense.

All forms of nitrogen can be applied in early spring, preferably during the first part of April. But, if you want to use fall applications, it is best to use only the ammonium form of nitrogen on heavier soils such as silt or clay. You should wait until the fall soil temperature gets down to about 45 degrees F. Needed phosphorus and potash materials may be applied at any time.

Soil tests are accurate means of determining the need for plant nutrients—both as to rate per acre and ratio of phosphate and potash. If a pasture soil is acid, such fields should be limed with a finely pulverized grade of agricultural lime.

By using these practices, which are simple and easy to carry out, a farmer can get 7 to 10 days of earlier lush grass for grazing, as well as extending the grazing season into late July. The thicker turf on fertilized pastures helps the soil soak up and hold more rainwater, and helps control weeds and white grubs. Improved pastures will give quick and direct returns on invested fertilizer dollars, reduce the need for protein feed supplements, and allow cows to harvest more of their own feed.

Whether you use 16-8-8, 10-10-10, or straight nitrogen plus phosphate and potash, give your pasture the plant food it needs.

Study Problems of Intercropping

Radioactive phosphate fertilizer has been used by Michigan State University soil scientists to determine plant root competition for phosphorus in an intercropping system. Intercropping involves such practices as planting grass or legume seedings between row crops and interplantings of such crops as corn and soybeans.

Intercropping to get higher total production per acre or to divide the planting and harvesting work load is being considered more and more by agronomists. Interplanted crops compete to some degree for moisture, light and soil nutrients.

Using radioactive phosphate fertilizer as a tracer, the MSU soils workers found extensive competition for phosphorus between several series of interplanted row crops.

It was found, for example, that corn roots penetrated the less extensive root systems of beans or sesame to obtain phosphorus from fertilizer applied close to the beans and sesame, leaving them with less phosphate. At the same time, there was little cross-feeding between adjacent bean and sesame rows for similarly placed fertilizer phosphate.

—Michigan State University

15 Ways To Check Livestock Losses

Check your losses by following these rules on your farm . . .

Condensed from The Progressive Farmer

Pete Head

ARE there thieves in your flock or herd?

They may wear the cloak of a parasite, a chronic disease, poor feeding practices, or inferior breeding. Losses from these sneaky robbers add up to much more than losses from major drouths, floods, and disease epidemics.

Here is a grower who is getting a 120% lamb crop year after year. No thief here. This grower has the equivalent of an extra lamb crop every five years, when compared with the flock owner who gets one lamb per ewe.

Would you be happy if you lost all your calves one year out of five? That's what is happening if you get a 75 to 80% calf crop year after year.

Get those thieves away from your pigs, and average eight or nine pigs per litter. The one or two extra pigs more than pay for the extra time and cost they create.

What is a good animal? Definitions vary widely. Performance testing has shown that gaining ability of beef cattle will vary from 1.6 to 3 pounds per day. Some dairymen keep cows that give only 4,000 to 5,000 pounds of milk, yet the cows eat just as much as their stable mates that give 9,000 to 10,000 pounds.

You will see cattle losing weight on pasture, and dairymen experiencing a summer slump in milk production. Both of these are costly. But often more costly for a dairyman is feeding of low-quality roughage.

Lambs and calves get off to a slow start when their mothers are wintered on low-quality roughage alone.

A broiler grower can no longer be content with birds that reach only 2¾ pounds in nine weeks and eat 3 pounds of feed for each pound of gain.

If this is the sort of thing that is going on on your farm, turn detective—track down the thief.

Other diseases and parasites are

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The Progressive Farmer, 821 North Nineteenth Street, Birmingham 2, Alabama

still taking their annual toll, even though cattlemen and milk producers have called upon local, state, and federal veterinarians to help stamp out brucellosis. Wormy calves, pigs, and lambs lag behind worm-free animals in daily gains. Extra days, extra feed, extra care — all are required for them to reach desired market weights.

Those little losses are costly. But they can be checked in the following ways:

In breeding:

1. Use performance-tested or proved sire.
2. Cull females on performance as well as conformation.
3. Select herd or flock replacements from animals of known performance.

In diseases and parasites:

1. Carry out a strict sanitation program.
2. Use vaccines.
3. Test herds and flocks regularly and sell positive reactors.
4. Use drugs, antibiotics, chemicals.

In feeding:

1. Use balanced ration, including minerals, vitamins, and feed additives.
2. Provide plenty of water.
3. Feed high-quality hay and silages.
4. Use both permanent and supplemental crops for grazing.

In management:

1. Keep adequate breeding and performance records.
2. Cull according to production and performance.
3. Provide a shade in pastures.
4. Use mechanical cooling equipment to avoid extremely high temperatures.

Important To Ear Mark Pigs

In any hog growing operation where selection is to be done, pigs should be ear notched for identification later when selection work begins.

Pigs may be ear notched as they are born. In all cases, each litter should be ear notched soon after farrowing. Ear notching is, of course, a must in all purebred breeding programs. Although often overlooked, ear notching of litters for later identification is vitally important even with a cross-breeding program because, if progress is to be made, selection is just as important in a crossbreeding program as it is in a purebred program. In fact, some would claim it is even more important.

Insects And Man

The struggle between man and insects for domination of the world goes on. Who will win? . . .

Condensed from Organic Gardening and Farming

Robert Rodale

MAN and insects are two of the most efficient forms of life on this planet. Other organisms, such as the elephant and the lion, are more powerful and more terrifying in their immediate area, but they have never been able to achieve the vast influence that both man and insects have over entire continents.

Think for a moment of the prodigious feats of engineering and destruction that have been accomplished by man and insects. We humans have learned to make hydrogen bombs, for example, but every day insects cause as much destruction as several hydrogen bombs. We have built wonderful skyscrapers of almost a hundred floors, but we can't make a home or office as easily as bees make combs. And we have never learned how to make a sweet liquid as fine as honey.

Man's ability to reason has given him a tremendous advantage over insects. We can plan our course of action, while the insect relies on blind instinct. But there are signs that reason may not be enough of an advantage to balance the insect's tremendous ability to breed new populations and to adapt himself to new environmental situations in a short time. Where a human couple will take thirty years to produce a family of three or four, the descendants of two houseflies will breed countless millions in the same time. And it took the housefly less than ten years to breed populations that are immune to DDT, the most powerful insect killer that man's reason had enabled him to produce.

There are those who predict that eventually insects will get the better of us humans and possibly starve us by consuming all our food. That is an extreme view, but if you project the trend of the past few years about a

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century into the future, you will find some confirmation for that prediction. Insects have shown that they can adapt themselves to live with the most dreadful poisons we can dream up—poisons that may ultimately hurt us more than they hurt insects. And in addition, we make things easy for insects by growing only one crop over a large area, giving them a uniform diet to work on. Failure to rotate crops gives them another advantage.

A few sentences ago I said that man's ability to reason is an advantage in his dealings with insects. Perhaps "think" would be a better word, for "reason" connotes cool and collected analysis of a situation, and that is just what man *doesn't* do when he thinks about insects. We get hysterical. Mention "bee" and most people think of sting rather than honey. Put an insect on someone's arm and he will kill it or chase it away as fast as possible. We don't want any kind of insect near us, in our homes or on our property.

A slight aura of hysteria permeates our whole insect control policy. The farmers who demand a complete kill of all insects in their fields are being slightly hysterical. The mosquito control programs all along the Atlantic coast have been increased this year in hysterical fear of equine encephalitis. The housewife who can't stand even one fly in her house is another example of insect-hysteria. Because of our illogical desire to kill every insect that trespasses on our property, we are destroying the good insects with the bad, and are letting hysteria rob us of our chance to achieve a significant and permanent "working agreement" with the insects. In our search for unconditional surrender from the bugs, we are tricking ourselves into fighting on their terms, and are bound to lose.

Most Americans haven't even an inkling that we are now in the

Despite a drop of one-third in farm population, farm output has increased 70 percent in the past 20 years.

midst of a great battle with insects for domination of the world. They are unconcerned because they are confident that the scientists have the problem under control. Unfortunately, the type of scientists we have today knows so much about his specialty that he hasn't energy left to consider the broad, almost philosophical, problems of human existence. Furthermore, it is possible for our great U.S. science establishment to overlook legitimate scientific problems. In our battle with insects, there is one very important problem area that has been al-

most completely overlooked—the effect of insecticides on the soil. We study very carefully the effect of poisons on insects, and we consider the problem of residues on food and their effect on test animals. But there has been little work done to find out what effect those residues have on the soil. The lack of information on insecticides in soil was brought into sharp focus for us recently when we came upon an unpublished thesis by University of Wisconsin graduate student, Donald Lewis Mader, which cast a glimmer of light into that relatively unstudied area. The title—*Effect of Humus of Different Origin in Moderating the Toxicity of Biocides*—gives little hint of the momentous questions posed, but, believe me, this paper warrants careful study. The Soil and Health Foundation is offering to publish it in pamphlet form to make it available to libraries and anyone interested in poisons in the soil.

Taxes, hidden and direct, now take about one-third of the average individual's income. The average man works 12.5 hours of his 40-hour week for the federal government alone.

"Biocides" is a technical term used here to mean poisons in the soil. Mr. Mader's intent was to do research into the effect of insecticides and weed killers on the soil of seedling tree nurseries, where chemicals are freely used and where production per acre has an extremely high value. Here are a few facts he uncovered in surveying the literature on "biocides":

1. Debris under elm trees sprayed for Dutch Elm disease control contained 137 to 194 pounds per acre of DDT after several years of applications. When you consider that application of one or two pounds of DDT per acre have killed fish and wildlife, you can see the terrible effect that Dutch Elm spraying can have. When the elm trees are massive in size, the amount of spray used to cover them is tremendous—and dangerous.

2. After five years of orchard spraying 100 to 175 pounds of DDT remained in the debris and 13 to 105 pounds per acre in the surface three inches of soil. These facts on DDT in the soil are from an article by R. D. Chisholm in a 1950 issue of the Journal of Economic Entomology.

3. The persistence of DDT residues in the soil seems to be inversely related to the amount of organic matter in the soil. In other words, the more humus in the soil, the less residues accumulate. The major purpose of Mr. Mader's research was to find out

just how effective various agents were in neutralizing poison residues. What he found was that humus was really the only effective treatment for insecticide poisoning of soil. It is unfortunate that the farmers who do the most spraying probably are least interested in building up the humus in their soil.

4. Application of fertilizers to soil high in poisons greatly increased the toxicity, according to Mr. Mader's experiments. In some cases the entire stock was killed when fertilizers were applied. The implications of that discovery are readily apparent, and it poses a serious problem for chemical proponents to consider. They will have to put much more emphasis on humus if they want users of chemical fertilizers and insecticides to avoid soil-poisoning troubles.

5. One of the most startling implications of this piece of research is provided by the discovery that pesticide residues in the soil alter the nutritional balance of plants grown on that soil. Calcium and magnesium were reduced by almost all "biocides" and potassium was also effected. Nitrogen uptake was stimulated by most chemicals.

Mr. Mader's experiments are extremely significant to an analysis of the struggle for food between man and insects. While the chemical sprayers were complimenting themselves on developing new super-poisons, they largely overlooked the damage being done to soils by those poisons. The government exerts some control over poison residues on food, but it has taken no steps to regulate poison residues in soil. That is supposedly the farmer's private problem. And if Mr. Mader's work proves anything, it proves the difficulty of finding out the exact limits of poison damage to soil. In his summary he notes that residue accumulations may be very difficult to detect because the resistant products left in the soil may have an entirely different chemical analysis than the poisons originally sprayed. Chemical reactions in the soil can change insecticides into substances that are quite different but nevertheless just as poisonous.

An acre of performance is worth a whole world of promise.

The battle between man and insects is certain to continue for a long time. Each side is showing signs of learning from past defeats—and is adapting itself to new conditions of the fight. Insects, however, may be adapting faster than we humans. It is up to us now to use our vaunted ability to think to gain a few victories for ourselves.

FUN ON THE FARM

A Collection of Jokes and Humorous Farm Stories

A farmer once wrote to Sears-Roebuck to ask for the price of toilet paper. He received an answer directing him to look on page 307 of their catalogue.

"If I had your catalogue," he wrote back, "Would I asked you for the price of sech paper?"

The Dairy Plant Fieldman

★ ★ ★

"When are you going to fix that fence, Hiram?" asked his wife.

"Oh, next week when Silas comes home from college."

"But what'll the boy know about fixing fences, Hiram?"

"Well, he oughta know a heap. He wrote me that he'd been takin' fencin' lessons for a month."

Sunshine Magazine

★ ★ ★

"The weather here in Florida is so wonderful," said the old lady. "How do you tell summer from winter?"

Replied the hotel clerk, "In winter we get Cadillacs, Lincolns and stuffed shirts. In summer we get Chevrolets, Fords and stuffed shorts."

Farmer McIntire is a good neighbor—and a kindly man with but one fault. He has a genius for saying the wrong thing whenever his wife has company.

The guest, a somewhat snooty cousin, was beaming with pride. Her daughter, she was boasting, had won first prize in a music festival.

"Know just how you feel," said he. "Reminds me how tickled Mother and I were when one of our pigs won a blue ribbon at the fair." —*Edward L. Van Dyke in American Agriculturist*

★ ★ ★

Modern man is one who drives a mortgaged car over a bond-financed highway on credit-card gas.

★ ★ ★

An American tourist was knocked down by a speeding motor car in a Provincial French village. A friendly native rushed out and helped him to his feet.

"Parlez-vous francais?" asked the good Samaritan.

"No," replied the American, brushing himself off, "Chevrolet coupe." —*The Farm Spokesman*

"What's coming off out in front there?" asked the proprietor of the general store.

"A couple o' fellers from Blue Ridge swapped mules," replied the clerk, "and now each is accusing the other of skinning him."

"Well, then, why don't they trade back?"

"I reckon they are both afraid of getting skinned again."

Implement & Tractor

★ ★ ★

"Taxpayer"—one who doesn't have to pass a civil service examination to work for the government. —*The Southern Planter*

★ ★ ★

"How's your cotton coming on?"

"Aint got none. 'Fraid of boll-weevils."

"How's your corn, then?"

"Didn't plant none. Scart they'd be no rain."

"Plant any potatoes?"

"And have 'em eaten by pota-to-bugs?"

"What did you plant, then?"

"Nothin'. Jest played safe!"

Butter-Fat

★ ★ ★

An old-timer is one who remembers when kids jumped on a haymow instead of a Trampoline. —*Successful Farming*

★ ★ ★

A Scotchman married the half-wit girl because she was 50 percent off.

For Sale: 60 Weiner pigs. Phone Hooper 64-R3.

Ad from the Alamosa, Colorado, The Valley Courier, submitted by *Mrs. Estella A. Klaumann*, Center, Colorado.

★ ★ ★

Farmer: "Do you see that wood pile out there?"

Hobo: "Uh-huh, I guess so."

Farmer: "Well, I want you to saw it."

Hobo: "Mister, you saw me see it, but you sure aren't gonna see me saw it!" —*The Lion*

★ ★ ★

At a village concert at which the local blacksmith was chairman, a vocalist was loudly encored after singing "The Village Blacksmith."

As he was about to respond to the encore, the chairman whispered: "When you sing that again, put in a verse about me repairing automobiles."

—*The Farmer*

★ ★ ★

It's hard to understand why Americans want chairs that vibrate and cars that don't.

★ ★ ★

"I hear you have invented a revolutionary new machine to help poultrymen, Mr. McDougall. What about it?"

"It is wonderful," he replied, "truly wonderful! It will be worth millions to the poultry industry."

"But just what is it?"

"It's a revolving nest. When the hen lays an egg, the egg falls into a receptacle underneath. She turns around and seeing no egg proceeds to lay another." —*William Alva Bell in The Progressive Farmer*

★ ★ ★

A little girl was watching her mother spread cold cream on her face.

"What's it for Mommy?" asked the tot.

"That's to make me beautiful, darling," replied her mother.

She watched her mother remove the cream, and then in a tone of sadness whispered, "It didn't work, did it?" —*Iowa Farm Bureau Spokesman*

★ ★ ★

A woman is young until she takes more interest in the fit of her shoes than in the fit of her sweater.

★ ★ ★

In the old days a man who saved money was a miser; nowadays he's a wonder.

★ ★ ★

Elmer, thirteen, was puzzled over the girl problem and discussed it with his pal, John.

"I've walked with her three times," he told John, "and carried her books. I bought her ice-cream sodas twice. Now, do you think I ought to kiss her?"

"Naw, you don't need to," John decided after thinking a moment. "You've done enough for that gal already."

★ ★ ★

A farm wife was entertaining the small son of a friend.

"Are you sure, Tommy," she said, "That you can cut your meat?"

"I think so," Tommy replied, "We've had it this tough at home." —*The Ohio Farmer*

★ ★ ★

A very chic young woman walked into a furniture store and sought out one of its decorators. She wanted advice on how to augment her present furnishings. "What," asked the decorator, "is the motif—modern, oriental, provincial, early American?"

"Well," was the frank reply, "we were married only recently, so the style of our furniture is sort of early Matrimony—some of his mother's and some of my mother's." —*WEA Journal of Education*

★ ★ ★

The vacuum cleaner salesman scattered a sack of well-pulverized "barnyard residue" on the client's best rug, and then said: "Lady, if this marvelous electric sweeper won't pick up every particle, I'll eat it!"

"Start eating brother!" replied the husky housewife. "We don't have electricity." —*Texas Farming and Citriculture*

"I'm afraid I can't help you," he said to the man injured in a car accident. "I'm just a veterinarian."

"You're just the man," moaned the victim. "I was a jackass to think I could do 70 on those old tires."

★ ★ ★

An Italian scientist visiting America was being shown through a large milk bottling plant when a pipe sprang a leak and milk spurted in all directions. Immediately one man calmly turned off the main valve, another repaired the leak.

The Italian visitor was dumfounded. "In my country," he said, "everyone would have run around shouting; nobody would have thought of turning off the main valve until everything had been covered with milk. They would have had a wonderful time and talked about it for the rest of the day."

He shook his head: "That's the reason you have so many nervous breakdowns here—you don't let yourselves go!" —*Better Crops With Plant Food*

When the grocer informed her that the price of eggs was sixty cents a dozen she exclaimed; "Why that's five cents for each egg."

"Yes, mum," said the man, "but you must remember that one egg is a whole day's work for a hen." —*Holstein-Friesian World*

★ ★ ★

The cavalry recruit was instructed to bridle and saddle a horse. Ten minutes later the sergeant major came along and found the recruit holding the bit close to the horse's head.

"What are you waiting for?" he roared.

"Until he yawns," answered the recruit. —*Arkansas Valley Journal*

★ ★ ★

"Well, Henry, how does it feel to be a grandfather?"

"Oh, it's nice to have a grandson all right; the hardest part is getting used to the idea of being married to a grandmother!"

—*Santa Fe Magazine*

Contributions for this page are welcome. Send your "Fun On The Farm" story to Farmer's Digest, Fort Atkinson, Wisconsin.

Making Your Beef Cattle Pay

To stay in the beef business and make money you must use a combination of proven practices . . .

Condensed from National Live Stock Producer

Stewart H. Fowler, Louisiana State University

YOU CAN make more money from your beef cattle if you give full attention to the four major phases of your cattle program.

These four stepping stones to greater profits are breeding, feeding, disease and parasite control, and marketing.

Let's take a critical look at each of these major phases of your overall livestock program. What are desirable, attainable goals for each? What are the stumbling blocks that may be keeping you from those goals? What course of action will place the goals within reach?

First, let's consider breeding—not because it is any more important than the other three phases, because it isn't. Your financial success in the cow business will depend upon an equal balance of all four. Breeding merely makes a logical starting point for our consideration.

Are you producing a 95% or higher calf crop of thrifty, market-topping cattle? The first part of this breeding goal—a larger calf crop—depends on several major factors. These are: (1) Proper nutrition; (2) Control of infectious diseases affecting reproduction; (3) Effective selection of breeding stock, coupled with a sound culling program; and (4) Ratio of bulls to cows and their distribution on the range or pasture.

Avoid Stumbling Blocks

Under nutrition, there are three major stumbling blocks to peak reproductive efficiency: (1) Under-nourishment or over-condition; (2) Lack of Vitamin A, and (3) Phosphorus deficiency. Cows that are too thin often show irregular heat periods and may run short or silent heat. Overly-fat cows and heifers are often difficult to settle—as is true of many highly-fitted show heifers. Lack

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National Live Stock Producer, 139 North Clark Street, Chicago 2, Illinois

of Vitamin A can result in premature birth of dead calves and various other reproductive troubles. Phosphorus deficiency inhibits the occurrence of heat, and many cows calve every other year.

A systematic supplemental feeding plan which provides adequate protein, Vitamin A, and phosphorus, and which insures adequate energy intake, will give larger calf crops, less calving trouble, a shorter breeding season, and earlier calving.

With lush pasture, supplemental feeding is unnecessary during most of the year. If green grazing is short during late pregnancy, two pounds of high-quality hay (containing at least 35 milligrams of carotene per pound) or 0.6 pound of dehydrated alfalfa meal (100 milligrams of carotene per pound) may be fed daily to provide ample Vitamin A. Under most range or pasture conditions, phosphorus deficiency can be avoided by supplying bonemeal in mineral feeders. As a final word of caution, grow-out your replacement heifers — don't fatten them.

The "Big Four" among diseases affecting reproduction of cattle are brucellosis, vibriosis, leptospirosis, and trichomoniasis. Abortion is characteristic of each. All four can result in the persistent failure of cows to conceive. Inflammations and discharges from the reproductive tract may be present. If you note such symptoms in your cow herd, there's a good possibility that one of these contagious diseases is present. Get veterinary advice immediately so that early measures may be taken to control and eliminate the infection.

Regular breeding cows with a calving interval of 12 months or less are absolutely essential to efficient production. It will pay to have your cows pregnancy-checked about 4 days after the end of the breeding season. Your veterinarian can detect the open cows by rectal palpation, and it will generally pay to market such cows immediately. The remainder of the cow herd may be checked for culling at weaning time. The deep-bodied, well-muscled cows with feminine heads that have weaned good, heavy calves and still maintained thrifty condition should be retained in the herd for another calf. It is good calving insurance to use only fertility-tested bulls. A semen examination prior to the start of the breeding season will give a fairly reliable fertility index for your bulls.

Over-population wouldn't be so bad if every person carried his share of the load and the responsibility.

Most of your replacement heifers will come from your own herd. Thus, it is important to use only bulls that are from highly-fertile, regular-calving cows. Such bulls will pass this factor to their daughters. In selecting replacement heifers, consider only those from highly-productive, heavy-milking cows. In addition, such heifers should possess desirable weight-for-age and should be the deep-bodied, feminine-h e a d e d kind that show real prospects of becoming top brood cows.

Make sure you use sufficient bull power. Low calving percentages can result from cows not having access to a bull while in heat. This may be due to a shortage of bulls running with the cows. Or, rough range country may reduce the efficiency of the bulls in locating cows that are in heat.

Keep Your Eye On Bulls

Four bulls for each 100 cows are recommended on the range. This number, however, should be increased to six or seven under conditions of extremely rough and brushy ranges. Under plains conditions, one bull for each 30 to 40 cows may be sufficient. Where matings take place in small pastures under general farm conditions, a mature bull will serve 50 to 75 cows.

The second part of the breeding goal is to produce thrifty, market-topping cattle. The double-barreled approach to this end is: (1) Mating good brood sows of ample size and muscling to thrifty, performance-tested bulls, and (2) Matching a sound breeding program with an equally sound feeding and sanitation program.

This brings us to consideration of the second phase of the cattle program — feeding. What goals should be set here? As yearlings, your cattle should produce 100 pounds of gain on less than 800 pounds of feed, of which about one-third will be roughage and two-thirds concentrate, and they should weigh close to 1,000 pounds if marketed at 16 months of age.

A good mineral mixture for cattle or sheep on a high roughage diet consists of two parts bone meal to one part loose salt.

Use New Feed Additives

Performance-t e s t e d breeding stock and well-balanced rations are essential to the attainment of this goal. Use bulls that have been performance tested for both rate of gain and feed efficiency. Rate of gain is approximately 50% heritable, and the feed required per pound of gain is about 35% heritable. This means that con-

siderable progress can be made in improving rate and efficiency of gain through selecting the most rapid and efficient gainers as breeding stock.

There is a rather high relationship between rate of gain and pounds of feed required to make a pound of gain. Thus, considerable improvement in efficiency can be made by selecting breeding stock from the most rapid-gaining cattle. Consequently, much of our performance testing work is based on the collection of records on rate of gain, and information is not obtained on feed efficiency.

About 60 to 70% of the differences in feed consumed per unit of live-weight gain in cattle is accounted for by rate of gain. However, there remains about 20 to 40% of the variation in efficiency which can't be accounted for by rate of gain. This may be due to such factors as differences in the rumen and hereditary differences in the ability of cattle to digest feed. Thus, with the increased stress on the importance of efficiency of gains as a means of increasing profits, it may pay to test breeding stock not only for rate of gain but also for efficiency of gain. This will mean keeping additional records, but it may prove to be a real paying proposition.

To get the most out of bred-in rate of gain and feed efficiency, follow sound feeding practices with well-balanced rations. Remember, the value of individual feeds depends on more than the amount of digestible nutrients they contain. Their value is also their physical effect, and their use affected by their palatability, with other feeds to furnish the quantity and quality of protein, essential minerals, and vitamins needed to form a complete ration.

If you are fattening your steers on pastures or in the feedlot, you are probably using diethylstilbestrol or one of the other synthetic or natural hormones of similar nature. Diethylstilbestrol increases weight gains and reduces feed costs when fed at a level of 10 milligrams per day. Steers receiving low implants of diethylstilbestrol (about 36 milligram pellets) respond equally as well as steers consuming 10 milligrams orally in their feed. The pellets are implanted in the ear of the steers at the time they are started on feed.

USDA scientists have discovered a possible new use for wheat. In laboratory tests, acid-modified wheat flour has proved equal to commercial sizing material for imparting strength to paper.

The increased number of experiments on complete pelleted

rations for cattle and the use of tranquilizers in the feedlot are worthy of close observation. Their use may soon join ranks with diethylstilbestrol in promoting faster and more efficient gains.

In the swirl of new findings in the field of animal nutrition, don't forget the importance of an edequate supply of good, clean water. A lack of a constant supply of clean water is still our most widespread deficiency in farm animals. Thousands of tons of feed are wasted each year because our live stock don't get enough water to help digest and utilize their feed. Mature cattle will consume an average of about 10 to 15 gallons per head daily.

Don't Buy Neighbor's Diseases

So much for the feeding phase — let's consider the sanitation phase of your cattle enterprise. The desired goal here is to reduce or eliminate losses from diseases and parasite. Remember that "an ounce of prevention is worth a pound of cure" in producing healthy, thrifty cattle.

As a starting point, an effort should be made to reduce periods of stress, which make the animals more susceptible to disease and parasite invasion. It helps to feed an antibiotic (30 milligrams per live cwt. in the daily feed) during periods of stress, and we should keep an eye on the use of tranquilizers as a means of reducing the effects of stress factors (castration, weaning, branding, etc.) in cattle.

A definite worming program is real insurance on your cattle investment. Phenothiazine is the most common drug used to expel intestinal parasites. It is usually given as a drench or by bolus, but it may be added to feeds as a control for the common stomach worm and the nodular worm. If an animal consumes a low level (about 2.5 grams) daily, the drug will have some killing effect on the female worms and the eggs that are passed in the feces. This low-level feeding program reduces pasture contamination and lowers the chances of infection of susceptible animals. The drug may be added to palatable feeds like ground grains, molasses, and cottonseed meal-salt mixes if the intake of phenothiazine is limited to approximately 2.5 grams.

Cull dairy heifers on the basis of ancestral production as well as their general appearance.

Isolation quarters should be provided for the quarantine of sick and new stock. It is advisable to isolate all new animals for a period of 30 days. This will allow time to observe and test for various diseases. Be reasonably sure that purchased replacements

come from disease-free herds.

Make adequate use of vaccination, sprays, and systemic insecticides. Blackleg immunization through vaccination is an almost universal practice. The vaccination of all animals from 6 months to 2 years of age is the only reliable and effective means of securing protection. Immunity should be established as early in life as possible. In anthrax-infected areas, routine vaccination provides an effective preventive measure.

There are a number of insecticides available for the control of lice and ticks. These include rotenone, DDT, BHC, chlordane, lindane, pyrethrum, and others. These compounds may be applied by pressurized spraying. From 200 to 400 pounds pressure is adequate for spraying cattle. There is a wide variation in the strength of the various commercial preparations, so you should follow directions carefully in preparing solutions. Solutions that are too strong can be toxic to your animals.

Plan Marketing Wisely

Systemic insecticides are now taking the place of rotenone for the control of cattle grubs. One systemic, Trolene, is given as a thumbsized bolus. Another, Co-Ral, is used as a spray, which must be applied at high pressure. It has to penetrate the animal's hair so that it can be absorbed through the skin to be effective. Systemics must be used after the grub has entered the animal but before the larvae have reached the animal's back.

In most areas, it is advisable to test all breeding stock once a year for brucellosis (Bang's disease). Periodic testing for tuberculosis is also advisable, because testing and removal of the reactors is the only effective method of control.

Think twice before visiting a sick herd — and then don't do it! It's a great temptation to try to diagnose our neighbor's troubles, but it's best to leave this up to his veterinarian. Disease organisms can cling to your clothes, boots, and truck and soon make your neighbor's troubles your own. It's far better to be safe than sorry!

Be alert to sudden changes in weather and adjust the poultry house ventilation accordingly.

This brings us to the last phase of the cattle enterprise — marketing. Here we must set a rather big goal or objective — *to place cattle of the right type, on the right market, at the right time, in the right condition, at the least possible cost.*

Marketing is the phase of the

enterprise in which most of us are basically interested, because it is at this point that the profit or loss of the enterprise begins to "show through." It is highly regretable, however, that it is at this point that an otherwise well-managed production program breaks down on many farms. The cold, hard fact remains that a highly successful breeding, feeding, and sanitation program can progress no further than the marketing program to which it is coupled.

Current market demand is for beef cuts with more lean meat and less fat. This means that our attention should be focused on producing a genuine meat-type steer. At 1,000 pounds liveweight, such a steer's carcass should hold a trimmable fat content of 6% or less, and there should be less than a half inch of fat on any surface. A meat-type steer should possess a minimum of two square inches of rib-eye area for each cwt. of carcass.

If you have a choice of outlets for marketing your cattle, you are faced with the questionable decision as to which is the right, or best, market. Consider the probable price, cost of services and transportation, and losses from shrinkage for the various markets. Then, make your decision. Remember, however, that the market that is best for you at one time is not necessarily the best one a year, or a month, or even a week later.

In considering the right time to market your cattle, remember that various classes and grades vary, in their months of highest prices. For example, Choice-steer prices are generally highest in August, September, and October, whereas Utility steers bring highest prices from March through June. Slaughter calf prices are highest during the first six months of the year. Prices for all cattle sold off grass tend to be lowest in the fall when the grazing period ends, and are highest in the spring. The reverse is true for the top grades of fed cattle — prices run high in the fall and low in the spring.

Population experts say that the world population is increasing at the rate of 100,000 a day or that every morning we have enough new people for a good sized city.

The majority of western cattle move to market in the fall. It may prove profitable for ranchers to avoid such highly seasonal operations. Such considerations as the operation of two or more types of range and twice-a-year marketing might swing operations away from the yearly round-up.

Many producers could arrange their production of feedstuffs to have a constant supply the year around. Many farmers in the grain areas follow this practice at present as it is easy for them to do so. Grains can be stored with little or no loss, and forages can be more easily preserved. Southern producers have an advantage of a considerably longer growing season. Through the proper use of permanent and temporary pastures and the harvesting of more hay and preservation of more silage, and through the increased production of corn and small grains, producers may find it profitable to keep their cattle on feed throughout the winter. The animals may then be marketed at higher prices in the spring.

To market your cattle in the right condition, they will be of the most desirable slaughter weight in demand in your market-area; grade Good to Choice (as these grades are in strongest demand); dress out high as a result of less fill and reduced shrinkage, and hang up bruise-free carcasses. If you develop a name for producing "reputation" cattle, you will secure a premium on most markets.

Uniformity in the load will usually pay extra dividends also. There is a tendency for buyers to associate uniformity of color in a set of cattle with uniformity of quality of carcasses. White faces, solid blacks, or other such colors that are characteristic of the beef breeds will usually bring a premium price over brindle or black-and-white colors. Cattle of the latter two colors are suspected of carrying Jersey or Holstein breeding. The packer buyer discriminates against dairy blood as it produces more waste offal fat and less desirable carcass conformation.

Finally, placing cattle on the market at the least possible cost is accomplished by sound planning and management of the breeding, feeding, sanitation, and marketing phases of the cattle enterprise. "Least cost" production fails if you let any one of these phases slip.

If you consistently meet these production and marketing goals, you are in the cow business to stay. You will more than hold your own in lean years, and you will receive those big extra dollar dividends in good years.

A new technique called "clipping" may make seeding of bromegrass much easier. Clipping removes a large portion of the excess hull, increases the weight of the seed and makes seeding easier with conventional seeding equipment.

New Test For Milk

Your milk price is now based on butterfat. This new test measures other solids.

Condensed from Farm Journal

Glenn Lorang

HERE'S a new, quick test for the food solids in milk below the creamline. Unfortunately, these solids go by the awkward name of solids-not-fat.

The handiwork of Dr. N. S. Golding of Washington State College, the test is not only a mighty hopeful sign to the dairy business — it's a simple one to run. Equipment needed for the test is simply a half-pint sample bottle and 10 multi-colored plastic marbles with a little grid to hold them.

Each plastic sphere has a different specific gravity—that's the key to the test. You simply warm up a sample of milk to melt the fat, then let it cool back down to 68 degrees and pour it into the bottle with the plastic marbles in it.

Then you count the spheres that sink to the bottom of the bottle and check the number on a chart that tells you the percentage of solids-not-fat in the milk.

And with the butterfat percentage from the Babcock test, all you have to do is add the two to get the total solids.

The new test is just as accurate as the Babcock test is for fat, says Golding. It measures to within twotenths of 1%. The accuracy depends mostly on the plastic balls, of course. They're a careful mixture of barium sulphate and other materials designed to expand at the same rate as milk over a wide range of temperatures.

Besides testing for the solids-not-fat, Golding's new test has another use. "We've used the tester to check for milk that's been watered," says Roy Olson, head of the Spokane City Health Department's milk division. "It's fast and easy to use and very accurate."

Other city health departments have been supplied with test equipment and several milk processors plan to have tank truck drivers carry the bottles with them to collect samples from each shipper.

Dairymen are most interested

Reprinted by permission from Farm Journal, Philadelphia 5, Pennsylvania

in the test because it could make it practical to price milk on a total solids basis. And that would mean that they'd breed cows to produce higher total solids.

In Whitman County, Wash., 50 herds are being tested to collect information from which a total solids pricing system can be developed.

"Our work is still on a pilot plant basis, but we hope a commercial firm can manufacture the equipment for widespread use," says Golding. He is supplying test kits to several institutions interested in using it

A Michigan State University scientist, Robert Brunner, paid Dr. Golding a visit last fall and came back home with some of the testing equipment. He's giving it a work-out in the laboratory, and plans to put some sets out with DHIA testers soon.

They'll compare it to the lactometer test developed by USDA scientists some time ago, and which is already in commercial production.

Actually, both new tests are designed for the same job. Maybe one will show up better than the other after extensive use, but at this point they both look practical, Brunner says.

"Both of them can help push us in the direction of pricing milk on its true value, and on what consumers really want, — the non-fat portion," he says.

He goes a step farther and says: "I hope that some day we'll test milk for protein. It's easy to do with a simple titration test. And protein is what consumers talk about these days."

Tin Can is 150 Years Old

The tin can, an indispensable item today, was invented 150 years ago. Think of how its use has grown in a century and a half.

Today there are more than 1,200 different canned foods to choose from. Eleven million tons of foods . . . about 8½ percent of all we eat . . . wind up in cans each year. That many cans set side by side in a row would circle the world 480 times. Over 2,700 canneries are busy keeping up with America's appetite for handy canned foods.

And that isn't all . . . foods canned today are higher in nutrition and taste better than ever before. They're sterilized too so they're completely safe.

Incidentally, the inventor or developer of the tin can was Peter Durand. —*New Mexico State University*

How You Can Use Backfat Probing

Using a knife and rule is the most common method now used to make a backfat probe. The rule is inserted and pushed through the fat. . .

Condensed from The Indiana Farmer

Dayton Matlick

"MEAT-TYPE hogs? Sure, I've heard of them," is the reaction of many farmers today. Meat-type hogs are the topic of many conversations. But what exactly is a meat-type hog?

This meaty animal has a thin backfat in comparison with his weight, has a full-muscled body, and is very economical from the farmers' standpoint. The only trouble is that he seems to be hard to pin down when surrounded by several of the more fatty type hogs.

The best method of selecting a meat-type hog is by backfat probing. By using one of the two kinds of backfat probing, it is possible to tell the percentage of major lean cuts in a live hog, if you know the length of the hog or the weight.

With the use of backfat measurements on gilts and boars, it would be possible to select the best animals for breeding stock replacements in your herd.

The Three Methods of Probing

There are really three methods of backfat probing, but one of the methods is not yet considered to be practical for the average farmer. The first is the use of a thin metal ruler. When using the ruler, which is the most popular and economic method, an incision should be cut just large enough for the ruler. The ruler is inserted and pushed through the fat.

The ruler will travel through the fat easily until it reaches a layer of "false" lean. It is important that more pressure be applied so that this layer is penetrated, in order to get a true measurement.

Once this layer is passed, the ruler will continue to move easily through the fat until it reaches the tissue covering the lean meat. It is important that the cut in the back be made at right angles to the backbone so that the ruler won't go into the muscle tissue.

The measurements should be

Reprinted by permission from
The Indiana Farmer, 300 East Fall Creek Boulevard, Indianapolis 5, Indiana

taken at the shoulder, in the middle of the back, and over the hip bone. All measurements should be taken slightly off to one side or other of the backbone in order to get a true measurement. The three measurements are added together and averaged to get a backfat figure.

Extensive use of this method has shown that there is little danger of infection, especially if a clean knife and ruler are used.

In 1954, a meter was developed for measuring the thickness of backfat of live hogs. The "Lean-Meter" uses the principles of electricity in determining the backfat thickness. Only a slender needle is inserted in the hog's back until it reaches the lean.

The largest farm in the United States is the King Ranch of Texas, covering about one million acres.

A dial indicates when the needle has reached a tissue different from the fat through which is has been traveling. When the needle is withdrawn, the depth of the fat is indicated on a gauge.

Both the live-probe (ruler) method, and the Lean-Meter are fairly accurate estimators of carcass backfat thickness and the percentage of lean cuts in the carcass.

One drawback of these methods is that the hogs must be made to stand quietly. This is more of a disadvantage in markets than it is on farms. For the time that a farmer would have to spend on measuring the backfat of his breeding stock, the rewards would pay for his efforts many times over.

Markets May Use Ultrasonic Device

Another recently developed method is an ultrasonic device. This measures the time required for a high-frequency sound wave to travel down from the skin through the backfat to a layer of lean and rebound to the skin. The device can translate the time required into inches of backfat.

The ultrasonic instrument is not available in quantities and the price would put it above the reach of most farmers. The big future for this device could be at the markets.

USDA researchers estimated the possibility of a 25 per cent increase in value differentials between grades of hogs, if hogs were graded by the backfat estimates of the accurate ultrasonic device rather than by the estimates of a human grader.

But why should a farmer go to all of the trouble of making sure that the hogs he uses in his breeding stock are meat-type?

According to research conduct-

ed by Purdue and several other universities, a farmer can't afford not to produce meat-type hogs.

Hogs with good conformation and thin backfat are efficient for the farmer in two main ways.

First, it takes about three times as much feed to produce one pound of fat as it does one pound of lean meat. Using these same figures, a meat-type hog has much more feed efficiency for 100 pounds of gain than does his fat "cousin."

Second, you can market more pigs from each litter from a meat-type hog. Meat-type litters are larger in number at birth and more are still living at market time.

Another point in favor of meat-type hogs, says Norton Smith, Purdue livestock specialist, comes in the price field. On most markets, a 25-cent price difference is paid for 100 pounds of meat-type hog.

Economists figure that there should be a recovery in hog prices in 1961. In order to take advantage of this upturn in prices, a farmer should obtain meat-type hogs from disease-free herds. He should continue to improve this herd, or his original herd if he doesn't feel he should make a change, by careful selection of his replacement stock.

The main tool in this replacement selection is the backfat probe. This will reveal just which of his animals are meat-type.

The farmer should decide which of the two main probing methods suit his case best. If he has a large number of hogs to deal with, it may be advisable to use the more expensive meter. He can get help with his probing program from his County Agent and University Extension agents.

Coupled with feeding figures and records, the backfat probe can help you determine which of your replacement stock are meat-type, and as such will bring you a higher income with better feed conversion, more pigs marketed in each litter, and a better price.

Control Mites, Bedbugs, Lice

Spray your chicken house thoroughly with 1 per cent malathion before bringing in new pullets, says Entomologist Earle Raun of Iowa State University. This spray treatment—if the house has been cleaned well—should control mites, bedbugs and lice. Be sure though, to remove and burn all pigeon and sparrow nests and screen all openings through which these wild birds might enter—since they might re-infest the house.

Livestock Equipment Plans

The Midwest Plan Service announces a third complete book of equipment plans. You can build your own lambing, feeding, and handling equipment from the complete plans included in this publication. It is an 8½" x 11", 40 page booklet with a wide coverage of planning information for layout and systems in addition to the working drawings for dozens of necessary equipment items.

The TABLE OF CONTENTS INCLUDES:

Feedlot Layouts	Lambing Pens	Dipping Vats
Auger Installations	Ewe Stanchion	Trailer
Self-Feeders	Fences and Gates	Shipping Crate
Hay and Grain Feeders	Corrals	Bag Holder
Waterers	Sorting Chutes	Blocking Stands
Mineral Boxes	Loading Chutes	Rotisserie
Lamb Feeders		

Each item is presented ready-to-build. Each plan is complete, most have a detailed itemized list of the pieces required for construction. This book is not simply a catalog or illustrated brochure.

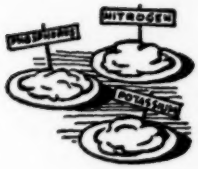
The other books in this series, "Beef and Dairy Equipment Plans" and "Swine Equipment Plans", have sold over 70,000 copies. This response from farmers. teachers, builders, and extension workers encouraged development of a similar book for the sheep industry.

Midwest Plan Service is a cooperative undertaking of the Extension Services and Experiment Stations of 13 Land Grant Colleges and Universities. It is nonprofit, and is completely supported through the sale of farm building and equipment plans.

Send one dollar for each plan book you desire to the Agricultural Engineering Extension of the state agricultural college nearest you: Urbana, Illinois; Lafayette, Indiana; Ames, Iowa; Manhattan, Kansas; East Lansing, Michigan; St Paul 1, Minnesota; Columbia, Missouri; Lincoln, Nebraska; Fargo, North Dakota; Columbus, Ohio; Brookings, South Dakota, or Madison, Wisconsin.

The books available are. Sheep Equipment Plans MWPS-3; Swine Equipment Plans MWPS-2; Beef and Dairy Equipment Plans MWPS-1.

Fertilize — And Profit!



Crops, just like your livestock, need a properly balanced diet if they are to produce capacity yields. And don't forget manure in your soil program . . .

Condensed from New Holland Grassland News

AMERICANS have a reputation for being smart business men. This is particularly true of American farmers. Clear proof of this business sense is the way farmers have taken to increased use of grass in their livestock programs.

We know of one New England farmer, for instance, whose 30-cow herd has been averaging 375,000 pounds of milk a year with about eight tons of grain. His cows get most of their total digestible nutrients from low-cost hay and grass silage. To make sure that his forage produces the most TDN possible, this farmer is careful to use plenty of commercial fertilizer and manure.

Thousands of dairy and livestock farmers can take a leaf from this farmer's forage management book.

More and more farmers are shifting to legume and grass forage as they seek more efficient production. How well such shifts pay off will depend to a large extent on two important points—quality of the forage and the yield per acre.

Adequate fertilization is a key factor in achieving both these requirements. Cecil S. Brown of the University of Maine points out that fertilization improves quality by promoting more timely harvesting and by maintaining longer life for legumes and grasses. Also, it increases the mineral and protein content of forage.

If you fertilize adequately you'll be able to harvest early enough to get the very best returns in high TDN and palatability, for either hay or grass silage. Farmers who skimp on fertilizer are forced to wait so long before making their first—and sometimes only—cut that the crop has passed its period of peak quality and is on the downgrade.

Aftermath yields of both legumes and grasses also are increased by proper fertilization.

Don't overlook the need for fertilizing permanent pastures as

Reprinted by permission from New Holland Grassland News, New Holland, Pennsylvania

well as cropland. Increased pasture produtcion through adequate fertilization and management is one of the cheapest and quickest ways to increase income, the experts tell us. Most farmers appreciate the need of applying the proper kind and amount of fertilizer when seeding. But there appears to be some who fail to recognize the importance of maintaining established pastures by regular application of fertilizer.

On many pastures, top-dressing is necessary every year to maintain both maximum quantity and quality. You're only short-changing yourself when you fail to recognize such need.

The value of high nitrogen applications on pure stands of bromegrass and orchardgrass is shown by tests made at Iowa State University. Forage yields of these grasses increased significantly with each application of nitrogen. Without nitrogen, the bromegrass yielded 3,042 pounds of dry matter and 403 pounds of crude protein to the acre.

With 120 pounds of nitrogen per acre, the yield on bromegrass shot up to 5,465 pounds of dry matter and 850 pounds of crude protein. Doubling to 240 pounds of nitrogen, raised dry matter yields to 6,757 pounds of dry matter and 1,269 pounds of crude protein.

Benefits to orchardgrass were slightly better. Dry matter yield went from 2,895 pounds without nitrogen to 6,027 pounds with 120 pounds of nitrogen and 7,688 pounds with 240 pounds of N.

The orchardgrass produced 325 pounds of crude protein without nitrogen and 875 pounds with the 120-pound application of nitrogen. For 240 pounds of N, the crude protein yield was 1,247 pounds. These tests indicate that less expensive grass-legume mixtures can be replaced by heavy rates of inorganic nitrogen under certain conditions, the researchers concluded.

Use of field bromegrass in the Corn Belt as a winter cover crop gives best results when supplied with plenty of nitrogen, according to William M. Brigg of the Soil Conservation Service. He believes additional nitrogen may be needed in the spring at plowing time to aid in decomposing the sod.

An abnormal child, nowadays, is one with manners.

While the high production per acre necessary to profitable farming these days calls for plenty of commercial fertilizer, let's not overlook the value of manure. Yearly production of manure per cow has been figured to be about

21 tons, exclusive of bedding. In terms of nitrogen, phosphorus and potash, fresh cow manure has a value of about $2 to $3 per ton. But as Dr. Firman E. Bear, famed soil scientist. has pointed out, manure has many other values as well.

Manure includes such important elements as calcium, sulfur, magnesium, boron and molybdenum. When manure is applied to the soil it activates the soil microbes, which release not only the fertilizer elements in the manure but also additional amounts from the soil itself.

A Connecticut study has revealed that heavily-manured soils hold many tons more moisture per acre in the plow layer than unmanured land. Manure applied to cornfield at planting reduces runoff and soil loss, according to an Ohio study.

Pennsylvania tests showed a 25% reduction in power needed to pull a 14-inch plow through clay soil when the humus content was increased from 2¼% to 3¼%. At North Dakota it was found that application of manure at a rate of seven tons an acre every four years over a period of 40 years helped maintain available phosphorus and retarded the loss of soil organic matter.

Applications of manure and phosphate markedly increased the yield of corn and wheat in tests. In Montana, yields of hay as high as 1,000 pounds an acre annually for six years were obtained when barnyard manure was applied on native range. Yield from untreated range was 80 pounds an acre.

Manure applications cut nitrogen losses in the soil in tests at four experiment stations in the North Great Plains. Nitrogen loss from the surface soil was 37% in non-manured rotations of corn, wheat and oats, but was only 17% on manured areas.

In Indiana studies, corn with no manure returned 40 bushels an acre. When five tons of manure an acre was added, yield was 62 bushels an acre. In experiments in Ohio, corn yields

You're a fortunate man if you have the courage to change what can be changed . . . the patience to bear what cannot be changed . . . and the wisdom to tell the one from the other.

have been increased by spreading manure, which contained straw, as a top-dressing on corn after the first cultivation.

A surface mulch of manure will reduce soil blowing on coarse-textured soil, the experts report. There seems almost no limit to the ways in which manure, properly spread, can help you make your soil more fertile and produc-

tive—and your farming operation more profitable.

In your soil management program, don't neglect the cheapest and most available fertilizer you have—manure.

Which Hog Growing Ration?

What about a simplified hog growing ration made of corn and soybean oil meal with fortification by vitamins, minerals, and growth promoting drugs?

Such a ration will do a good job, says a University of Wisconsin livestock specialist—but only if the ration is used carefully by an above-average hog producer who has machinery for thorough mixing of the fortifier, the knowledge needed for evaluating fortifier pre-mixes, and a willingness to follow recommendations to the letter.

R. H. Grummer feels the average hog grower would probably be better off with a ration that includes more variety—one that contains tankage or meat scraps, and alfalfa meal in addition to the corn and soybean oil meal.

Grummer gives three reasons a corn and oil meal ration is risky for many farmers:

1. Some farmers will cut the fortification when they're short of cash. This would leave the simplified ration seriously short of vitamins, minerals, and drugs.

2. Many different kinds of pre-mixes are available for providing the fortification. They don't always contain the proper proportions of the essential ingredients. It's hard for most farmers to tell which will do an adequate job.

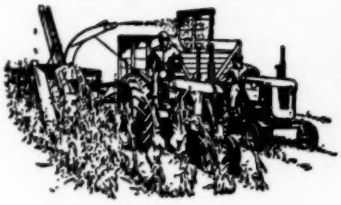
3. You use very small amounts of concentrated vitamins, drugs, and minerals. It's very hard to get these mixed well with the other ration ingredients using equipment we normally have on farms and in some local feed mills here.

There are many satisfactory programs for feeding swine. Formulas containing corn, soybean meal, meat scraps or tankage, a quality hay product, salt (with trace minerals), ground limestone, antibiotics, zinc salt and vitamin D are adequate to promote rapid and economical growth in many herds.

Herds that are under unusual stress, such as disease, may require additional fortification with vitamins and other essential nutrients. In such herds it is wise to use a fortified protein supplement or a pre-mix of critical ingredients that can be added to the regular ration.

—University of Wisconsin

High Yields Begin On Paper



Here is how 4,000 Wisconsin Corn Pacemakers proved this statement . . .

Condensed from The Furrow

G. E. Ferris

STUDY the fertility plan below — it's the one Bill Peterson followed to grow 156 bushels of corn an acre on his Crawford county, Wis., farm.

He's one of more than 4,000 Wisconsin pacemakers who have grown 100 or more bushels of corn an acre after accurately charting their plan for supplying needed soil nutrients. As with Peterson's, their higher yields begin on paper.

Based on results since achieving his first pacemaker yield in 1953, Peterson says: "Supplying plant food adequately to corn roots is the key to bigger yields." He fertilizes as soil tests indicate to grow the high yields planned.

Eight-year records show a huge yield increase from such planning: Since 1952 when University of Wisconsin launched its corn pacemaker program through county extension agents, the state's average of corn picked for grain has been 60 bushels an acre. By following recommendation's of the University's agronomy, soils, entomology, and agricultural engineering departments, pacemakers averaged 105 bushels —a 45-bushel margin over the statewide figure.

The corn pacemaker program recently assumed a new look. Cooperating growers, statewide, now are demonstrating various cultural practices, including planting methods, hybrid maturity range, and fertilizer, herbicide, and pesticide treatments. When comparisons become conclusive, recommendations will be made to guide successful corn growers to even more efficient production and still higher yields.

Peterson plants a 112-day hybrid, hill-dropped 2 kernels per hill in 40-inch rows to grow 16 to 18 thousand corn plants an acre. Insecticide treatment of seed avoids worm damage to seed and seedlings. Peterson wheel-track plants right after plowing

Reprinted by permission from The Furrow, Moline, Illinois

SOIL NUTRIENTS NEEDED FOR 150-BUSHEL CORN YIELD PER ACRE

Source of nutrients	Lbs. nitrogen per A.		Lbs. phosphate per A.		Lbs. potash per A.	
	Present	Crop gets	Present	Crop gets	Present	Crop gets
In soil (by test)	200	40% or 80	161	40% or 64	252	40% or 101
10 tons manure per A.	100	30% or 30	50	30% or 15	100	50% or 50
Plowed legume sod		60				
250 lbs./A. 6-24-24 (Starter)	15	60% or 9	60	30% or 18	60	50% or 30
80 lbs./A. anhydrous ammonia (Sidedress)	65	60% or 39				
Total nutrients available to crop		218		97		181
Total nutrients needed for 150 Bu.		225		90		180

—on the contour to save soil and water. Using chemical weed killers, he's had best results from spraying with 2,4-D when corn plants are about 5 inches high. One cultivation, combined with a side dressing of fertilizer, usually suffices with his rotation of corn, oats, and alfalfa-brome mixture. Dairy, swine, and sheep production round out operations on the 206-acre farm.

Factors Relating To Eating Quality of Pork

Relationship between swine carcass measurements and eating quality of pork is being studied at the University of Arkansas' Agricultural Experiment Station. M. C. Heck, assistant animal husbandman, has reported the following preliminary results from the study:

"Chilled carcass weight and backfat thickness appeared to be the best indicators of eating quality among the carcass measurements investigated. Carcass length and loin area appeared to be poor indicators of eating quality. Shrink during curing, smoking, and aging was closely related to eating quality of country cured and commercially cured hams."

Heck explained how hams from 24 U. S. No. 1 slaughter hogs were used at the Arkansas Station to study relationships between carcass measurements and tastepanel scores. Carcass measurements included chilled weight, dressing percent, backfat thickness, carcass length, and loin area. The tastepanel scored cooked center slices of hams for aroma, flavor of fat and lean, texture, tenderness, and juiciness of the meat. —*Arkansas Agricultural Experiment Station*

Quackgrass Control

Quackgrass is a crop weed that bothers a large segment of our farms. Here is how atrazine can be the knockout for this enemy . . .

Condensed from Agronomy News

QUACKGRASS is a serious perennial weed found in many parts of the United States. Although it produces a great amount of seed, it seems to spread primarily from the underground root system (rhizomes). The rhizomes are spread by plowing and cultivating, and each year the patches in the fields seem to grow larger.

Quackgrass spreads from farm to farm by seed, however, and new infestations on farms that never had quackgrass usually come from planting grain that contained quackgrass seeds.

Rotations are seldom effective in eliminating quackgrass. To get effective control, the ground should be cultivated several times during the summer in such a way as to leave the rhizomes on the surface to dry out, and no crop should be grown. In recent years a series of new chemicals have been used to kill quackgrass. They include maleic hydrazide, amino triazole, and Dalapon. Under good conditions all three of these materials will completely eliminate quackgrass, but under certain other conditions they will fail. Dalapon has proved to be superior to the others, and it has been recommended for use in the fall or in early spring. Since there is a residual effect, new plantings should not be made for three or four weeks after the spring treatment. Because some effective results have been obtained with Dalapon, it will continue to be recommended for controlling quackgrass.

During the past four years, the Agronomy Department at the University of Wisconsin has specialized in quackgrass control, and workers there report outstanding success with Atrazine. This new compound has been used primarily as a pre-emergence treatment for controlling weeds in corn; but because of the outstanding results reported from Wisconsin and also from New York, it will undoubtedly be widely used

Reprinted from
Agronomy and Soils News, College of Agriculture, University of Illinois, Urbana, Illinois

in the future to control quackgrass.

Atrazine should be applied at the rate of 5 pounds of the commercial material in at least 20 gallons of water per acre. This rate is equivalent to 4 pounds of active ingredient per acre, since the commercial material is 80 percent pure. Because Atrazine is a wettable powder at least 20 gallons of water is needed to keep the particles suspended and provide good coverage. The material should be applied during most active growth. Quackgrass grows most actively during the early spring or fall but becomes dormant or semidormant during the summer. The fall and spring are ideal times to treat with Atrazine. If the quackgrass has gone to seed, it should be mowed close to the ground so that the new growth can be treated.

During the fall, Atrazine can be applied any time from late August until the ground freezes in late October. It can be used on harvested cornfields, soybean stubble, or legume fields that are to be plowed for corn the following year. When Atrazine is applied in the fall, the ground should not be cultivated until spring because it is necessary for fall rains to wash the material into the soil around the underground root system. Corn should be planted in the spring following the fall treatment, since the Atrazine residue may injure other crops. The year following corn, any crop can be planted because the residue in the soil will have disappeared.

The fall treatment with Atrazine to control quackgrass has been fully approved by the Federal Drug Administration and can be used safely. Wisconsin is reporting excellent results from applying half of the recommended rate of Atrazine in the early spring before corn planting. This treatment, however, has not been approved by the Federal Food and Drug Administration and cannot be recommended at present.

Little harm will come to tomorrow's joy if you borrow a little of it for today.

The University of Wisconsin reports that in four years' trials Atrazine has been used successfully as a fall treatment. It has been much more consistent than the other herbicides available for controlling quackgrass. Since it does not interfere with the cropping system or time or planting, it should have wide acceptance. Because of recent fall rains, quackgrass should be in an ideal growing condition now for this treatment.

Don't Rob Your Soil

Allowing your fertility inventory to deplete is a sure way of being a soil thief . . .

Condensed from Western Farm Life

MOST farmers are aware that commercial fertilizers return several times their cost by increased yields.

However, most are not aware or may have forgotten how much plant food is removed by a crop. Naturally, to maintain or improve fertility levels an equal or greater amount must be returned.

Then, too, a balance or inventory must be maintained in the soil as all the plant food is not available to the growing crop. In fact, plant efficiency is considered about 60 percent on nitrogen, 25 percent on phosphorous and 40 percent on potash.

The table below gives the approximate plant food removed by crops as well as the average amount added when materials are plowed under.

Assuming lime requirements have been met, fertilizer for maximum yields is rather easily calculated from the average amount of minerals removed by the crop. The table can be easily adjusted for whatever yield level is present on the individual farm.

For example, 100 bushels of corn requires about 150 pounds of nitrogen and as the plant is about 60 percent efficient, 250 pounds need to be present in the soil for the crop. If a strong alfalfa clover meadow has been turned under providing 60 pounds of nitrogen, the crop still will require 90 pounds in some form of commercial fertilizer or manure to equal that used, or more if the nitrogen balance is to be increased.

The same crop will need 25-30 pounds more phosphorous than is added in the alfalfa plowed under and about 35 pounds more of potash. This would mean about 250 pounds of fertilizer such as 12-12-12 in the row, plus 60 pounds of extra nitrogen plowed under or used as a side dressing in either dry or liquid form.

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Crop Produced	Per Acre Yield	Lbs. Used Nitrogen	Lbs. Used Phos.	Lbs. Used Potash
Corn (grain & straw)	100 bu.	147	53	94
Oats (grain & straw)	80 bu.	66	27	56
Wheat (grain & straw)	40 bu.	70	28	47
Soybeans (grain & Straw) ..	40 bu.	219	49	72
Bluegrass (pasture or hay) .	3 ton	81	33	126
Timothy (pasture or hay) ..	3 ton	70	23	85
Alfalfa (pasture or hay) ..	3 ton	166	33	97
Red Clover (pasture or hay)	3 ton	129	29	107
Sweet Clover (pasture or hay)	3 ton	148	32	101
Material Plowed Under	**Per Acre**	**Nitrogen**	**Phos.**	**Potash**
Manure (protected)	10 ton	+50	+20	+100
Manure (open lot)	10 ton	+50	+20	+ 20
Plowdow (stalks-straw)		+15	+25	+ 30
Plowdown (mostly grass) ..		+15	+ 5	+ 10
Plowdown (clover & grass) .		+30	+15	+ 30
Plowdown (alfalfa & clover)		+60	+30	+ 60

High Nitrate Feeds May Cause Vitamin Deficiency

Cattle and sheep eating feeds containing high levels of nitrate will likely develop a serious deficiency of vitamin A when their only source of this vitamin is carotene found in forage, according to George Garner, University of Missouri agricultural chemist.

Early University studies showed that nitrites are more closely related to the problem of vitamin A and E deficiencies than are nitrates. Nitrites are formed from nitrates by fermentation in the rumen of either cattle or sheep.

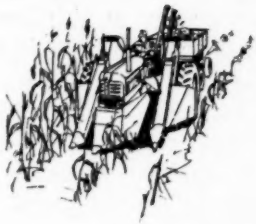
In a recent study, rats which received nitrites as a part of their ration developed Vitamin A deficiency much faster than did the control group not receiving nitrites.

Even when fed a vitamin A supplement, rats getting nitrites failed to store any vitamin A in the liver. These rats also started showing vitamin E deficiency in spite of ample amounts in the ration.

This means the livestock producer may want to use a supplement containing both Vitamin A and E in cases where nitrate toxicity is suspected, Garner says.

Missouri researchers are continuing their study with both rats and ruminant animals to determine more exactly what happens when livestock are fed high nitrate feeds. *—University of Missouri*

Farming Tools Place High In List Of Great Inventions



Condensed from Missouri Ruralist

Gordon West

WHAT are the greatest inventions mankind has produced?

One answer came to this question in 1936, when a secret national committee of prominent men named the top inventions developed by 12 Americans. The list was announced at a banquet that celebrated the 100th anniversary of the American patent system.

Agriculture was represented on this famous list—Eli Whitney's cotton gin and Cyrus Hall McCormick's grain reaper. Other inventions honored: steamboat, telegraph, sewing machine, air brake, telephone, electric lamp, motion picture, phonograph, linotype machine, airplane, vulcanized rubber and a process for making cheap aluminum.

In a 1914 contest, sponsored by a national magazine in the United States, the entry of William Wyman, of Washington, won. He listed these 10 greatest inventions: electric welding, airplane, electric furnace, steam turbine, moving picture, gasoline motorcar, wireless telegraphy, cyanide process with metals, induction motor and the linotype machine.

To these lists, one easily could add the development of the X-ray, Diesel engine, fountain pen, bicycle, radar, dynamite, glass, plow, television, radio, adding machine, tractor, telescope, refrigeration.

Who was the greatest inventor of them all? Most experts agree it was Thomas Alva Edison, that New Jersey-born American who dreamed up dozens of items that make our lives so pleasant and efficient today! His inventions include the electric light bulb, phonograph and motion pictures.

Close behind Mr. Edison with

Reprinted by permission from Missouri Ruralist, Fayette, Missouri

the longest list of inventions to his credit was Eugene T. Turney, who died at the age of 93 in August, 1959, at Pawling, N. Y. Among his inventions: an automatic milling machine, automatic player piano, daylight loading for cameras, block signals for railroads, automatic braiding machine, automatic transmissions for automobiles, first speedometer, adjustable snare drums, optical measuring instruments for photographic light meters.

Mr. Edison gave a speech in New York City, in 1909, predicting the great inventions of the future. Fourth on his list was a new fertilizer (nitrogen) process in which nutrients would be drawn from the air by electricity, to increase the productivity of the soil!

Many a farm wife and daughter has "thanked the lucky stars" many times when seated at a sewing machine and busily making something to wear. Elias Howe was the inventor of this grand machine! The year was 1846. The typewriter was the brainstorm of Alfred E. Birch, in 1856. And in 1857, Dr. S. W. Travis added an efficient keyboard to the typewriter. In 1875, the Remington company came out with the bar-and-key typewriter we have today.

Oliver Evans invented a flour mill in 1785 in which most of the milling operations were performed mechanically. His mill was the early forerunner of the great mills and factories of today. The Evans mill took in grain from a wagon, weighed it, elevated it to the top of the mill, dropped it into hoppers, ground it, cooled it, dropped it again, bolted it and barreled it!

Cost of Mechanized Feeding

Ensilage storage capacity has taken a big jump, increasing by 40% during the past four years in Michigan alone, says C. R. Hoglund, Michigan State University economist. This has brought larger investments in labor-savers such as mechanical unloaders, feeders and wagons.

For $60 a cow, a dairyman with a loose-housing system can mechanize to feed forage to a 60-cow herd in an hour a day. Hoglund estimated that a fully mechanized feed lot should be operated for around $500 a year.

For the steer feeder, a $6500 investment should provide a good labor-saving system to feed 200 steers at a cost of $3 a month in electric current. A concrete feeding floor is advised, and can be built for 18c to 25c per square foot. —*Better Farming*

Liquid Meters — An Aid In Marketing Milk

Will these milk meters meet the test of modern dairy methods? . . .

Condensed from Agricultural Marketing

Fred Stein, U.S.D.A.

METERS for measuring liquids have been used in this country for many years—for everything from measuring water consumption in the home to measuring quantities of highly volatile chemicals or fuels at plants and missile centers.

Yet, despite their widespread acceptance, meters have only recently been developed for the American dairy industry. It has been difficult to manufacture a meter that meets the stringent requirements of accuracy and cleanliness.

Milk meters, however, can be an important aid to the dairy industry. Their use simplifies the problem of checking the amount of milk and milk products received at the plant. They also are helpful in various plant operations and in the final measurement of bulk milk as it leaves the plant.

At the farm, milk meters may eventually be of use on bulk tank trucks. This would eliminate the costs of calibrating and recalibrating farm tanks. And it would remove the possibility of human errors in weighing and sampling the milk.

In general, there are four types of flowmeters adapted for the dairy industry—positive displacement, turbine, ultrasonic, and electromagnetic meters.

A recent survey by the Dairy Division of the Agricultural Marketing Service of the U.S.D.A. showed how these meters are being put to use in 74 of the Federal milk order markets.

Meters are used mostly to measure plant receipts of milk from farm pickup tankers. In this way, they provide an at-plant check of the quantities of milk measured on the farm.

A comparison of farm measurements with flowmeter recordings at the plant showed the weights of only 7 percent of the shipments in complete agreement. Forty-

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eight percent of the farm measurements were higher than the metered readings; 45 percent were lower.

Within the plant, dairy processors use flowmeters to measure the quantities of milk, cream, and skim milk used in the manufacturing operation. They also use them to measure liquid ingredients of batch-mixed products such as ice cream mix.

In a few milk markets, flowmeters are installed to record the quantity of bulk fluid products as they move out of the plant.

Only at the farm level is the use of flowmeters somewhat undetermined. A satisfactory flowmeter has not yet been developed for use on pickup tank trucks.

But, in the areas where flowmeters are being used, their numbers are increasing. Whereas two years ago only about a third of the milk markets surveyed by Agricultural Marketing Service used meters, in January of this year about two-thirds reported their use.

The cost of flowmeters varies widely with the type of meter, its size, and its flow rate. Generally speaking, a positive displacement milk meter costs from $1,500 to $3,000. Turbine meters run anywhere from $900 to $1,700, and variable area meters from $300 to $400.

Costs of ultrasonic and electromagnetic flowmeters are not available. These instruments are still in the experimental stage.

Actually, much additional research and development on milk meters is needed. Some meters have already proved their usefulness within milk plants for checking overall receipts and product flow. But whether meters will eventually find importance application in measuring volumes of individual producers remains to be seen. It will depend on how well the meters meet the critical requirements of accuracy, reliability, and sanitary acceptability.

High-Roughage Pelleted Rations Work Well

Dixon Springs Experiment Station tests show that cattle receiving pelleted rations containing 40 percent roughage and 60 percent concentrate performed as well as cattle getting a ration of 20 percent roughage and 80 percent concentrate.

George Cmarik, station research worker, reported these results at the 1960 Cattle Growers Days. Operated by the University of Illinois College of Agriculture, the Dixon Springs station is located near Robbs.

—University of Illinois

How Effective Are Hay Conditioners?

Stems cracked by crusher dry faster.

Tests at Iowa State show that, with proper management, hay conditioning can result in better-quality hay and decrease exposure risks. In good weather, conditioning can cut curing time almost in half . . .

Condensed from Iowa Farm Science

T. W. Casselman, former Associate in Agricultural Engineering, and *Robert C. Fincham,* Assistant Professor of Dairy Husbandry, Iowa Sate College

HAY conditioners can result in better-quality hay and decrease the exposure risk for your crop — if you use them with certain common-sense management rules concerning timing of mowing and conditioning.

Tests at Iowa State show that, during good weather, conditioning can cut the curing time for hay almost in half.

It's a common farm experience to cut high-quality alfalfa for hay and then, because of weather damage, end up gathering and storing low-quality hay — with only a portion of the original dry matter and nutrients. One of the main reasons is that the periods of good drying weather during the haying season are often shorter than the time needed for field drying.

At the same time, the leaves of common legumes cut for hay dry faster than the stems. If you leave your hay in the field long enough for the moisture content of the stems to be low enough for baling, you find the leaves dried to the point where shattering losses are serious. This has frequently prompted the idea-wish to find some way to hasten the drying of the stems or to slow down the drying of the leaves.

Actually, the common practice of raking hay into windrows at a moisture content of 40-50 percent is an attempt to do just that. The mass of stems and leaves does tend to dry more uniformly than if left in the swath, but windrowing also lengthens the over-all drying time. Windrowing does reduce bleaching, a factor that can downgrade hay quality. But, basically, windrowing does nothing

Reprinted from Iowa Farm Science, Iowa State College, Ames, Iowa

to shorten the total time necessary for field curing.

It wasn't until hay conditioners came along that shortening of field-drying time became a practical possibility. These conditioners all perform the same basic operation. They crush, crimp or lacerate the stems so that more stem area is exposed to permit a more rapid release of moisture.

Types of Machines

Many different makes have appeared on the market since hay conditioners were first introduced. But they can all be placed within three general classes: the corrugated roller, the smooth roller and the flail-type forage harvester as adapted for conditioning.

The corrugated roller machine, commonly called a crimper, consists of two cast-iron rolls with tapered flutes that mesh much like gear teeth. Hay in the swath is picked up by the lower roll, and the stems, on passing through the rolls, are cracked at uniform intervals.

The smooth roller machine operates in much the same fashion except that the stems are crushed along their entire length rather than at intervals. The rolls of some of these machines are smooth steel; others are rubber or rubber covered.

The flail-type harvester has a 5-foot rotating shaft parallel to the ground. A series of L-shaped swinging hammers or knives are attached to this shaft which rotates opposite to the direction of travel of the machine. When the machine is used as a hay conditioner rather than a harvester as such, its shear bar is removed to reduce the cutting action. The idea is to mutilate and shred stemmy material as much as possible without chopping it into short pieces.

If the material is cut to short, it won't remain fluffy. For this reason, the forward speed of the machine is increased beyond that for conventional forage harvesting, but the rotor speed is reduced. A suggested rule of thumb is to adjust and increase forward speed and to decrease rotor speed until the machine is operating at a point just short of plugging. With rough field conditions, of course, high forward speeds can't be used, so a compromise is necessary.

In a recent report to the U.S. Atomic Energy Commission, scientists estimated that the peak level of strontium 90 in world diet was passed in 1959.

When used as a conditioner, a panel in back of the flail-type machine is opened allowing the green hay to fall back on the

ground in a swath. A downspout attachment can be used to convey the conditioned hay back to the ground in a fluffy windrow. By swinging the downspout to the side on following rounds, as many as three 5-foot swaths can be put into the same windrow. One advantage of this method is that cutting and raking are performed as one operation. Off hand it might seem that hay conditioned and windrowed in this manner would call for a longer curing time than conventional methods. But this isn't necessarily so.

Our Tests

We conducted a series of hay-drying and conditioning experiments on first-, second- and third-cutting alfalfa in 1959. The purpose: to determine the relative merits of hay conditioning as compared with the conventional mow-rake-bale method of harvesting hay. We compared harvesting and conditioning with a crimper and flail-type machine with conventional harvesting. A smooth-roll crusher wasn't included in our trials. Tests in other states, however, indicate that the drying rates of crimped and crushed hay are quite similar, with a slight advantage in favor of the smooth-roll machine.

Best results with crushing in the past were obtained when hay was conditioned immediately after mowing. We followed this practice in our tests. An efficient way to do this is to attach the crusher behind the mower so that hay in the previous swath is conditioned while the next swath is mowed. Doubling up like this saves an extra trip around the field with the crusher.

The flail-type machine used had a downspout for placing the conditioned hay in a windrow. We tried both two- and three-swath windrows, but, as far as we could tell from these tests, one size didn't cure any faster than the other. Alfalfa used in the experiments was about an average stand; with an extra-heavy growth, a two-swath windrow might cure faster than a three-swath windrow.

Rabies control depends on annual vaccination and control of stray dogs. Dogs should be vaccinated annually by a veterinarian.

Both the conventional and crushed treatments were raked at about a 40-percent moisture content. The flail-conditioned material was given a half turn with a single-wheel rake at about a 55-percent moisture content as recommended by the manufacturer. This exposes the bottom side of the windrow and helps speed up

the rate of drying. Careful use of a side-delivery rake would do the same job of turning as the single-wheel rake.

To follow the rate of drying, we took samples at intervals from the swaths and windrows of the variously treated hay, placed the samples on screen trays and weighed them. We took additional samples each time an operation such as raking or turning was performed to find the effect of each operation.

Our Results

Conventionally processed hay had the highest moisture content throughout the tests. This was also true for our tests with first and third cuttings. There wasn't much difference between the crimped hay in the swath and the flail-conditioned material in the windrow until the flailed material was turned to expose the underside of the windrow. At this point the flailed material dried more rapidly and continued to do so until the time of baling.

In this test, the turned flail-conditioned hay could have been baled at about noon of the third day; the unturned flailed hay, about 5 hours later. The crimped hay, when raked, begins to fall behind the flailed hay in rate of drying because of slower curing in the windrow. The unturned flailed hay, even though in windrows, tended to dry more rapidly than the crimped hay because of the flail's more severe bruising and the fluffier condition of the windrow which allowed some air movement.

Effects of rain: It did rain and remained overcast for one whole day and night during these tests. this, however, led to an interesting discovery concerning the three hay treatments.

When we reweighed samples after the rain, we found that the flailed hay hadn't gained as much water as the crimped or conventionally treated hay. This might have been chance, so we simulated a rainfall on another batch of hay with the same treatments with the same kind of results. The flailed material absorbed less moisture than either of the other two treatments. Table 1 summarizes the results for both the natural and artificial rainfall. Statistical analysis confirmed that the differences weren't due to chance or sampling variation.

TABLE 1. Pounds of moisture absorbed per pound of dry matter of hay in the windrow for three treatments.

Treatment	after natural rain	after artificial rain
Flail-cut	0.86	0.65
Crimped	1.15	1.16
Conventional	1.08	1.08

We aren't sure why the flailed material absorbed less moisture but it may be that the haphazard manner in which the flail-cut

material is laid onto the windrow tends to shed rain more effectively than windrows of material treated by either of the other methods. Observation indicates that the flail-cut windrow may perhaps be likened to a thatched roof — where grasses are laid on the roof pointing down. If the grass stems are laid on the roof parallel to the ridge, however, the roof leaks. A similar situation exists in conventional hay windrows since the rake's action tends to align the stems in the direction of the windrow, with a greater tendency for the "roof" to leak.

After the rain, all windrows were given half a turn as soon as the tops were dry. Once again, the flailed material dried more rapidly. This turning is important for any rained-on hay. But we found it especially important for the flailed material. Even a moderately heavy shower will compact the originally fluffy windrow formed by the flailed material and reduce the circulation of air. This results in a wet, soggy mass subject to rapid spoilage. But turning the windrow with a single-wheel rake or carefully with a side-delivery rake tends to refluff the hay and turns up the wet underside for drying.

Other tests: Our trials with first and third cuttings gave similar over-all results. The crimped and flailed material dried at about the same rate. Sometimes the crimped material dried more rapidly until the flailed material was turned.

In our tests with the third cutting, for example, we mowed and conditioned at 8 a.m. By 4 p.m. the crimped hay had a moisture content of 44 percent; the flail cut, 52 percent. The flailed material was turned at this time and dropped to a 43-percent moisture content by 7:30 p.m.; the moisture content of the unturned flailed hay and the crimped was 46 and 40 percent, respectively, at this time. The following morning, the moisture percentages were 41 percent for the turned flailed material, 46 percent for the unturned flailed hay and 49 percent for the crimped — indicating that the turned flail-cut hay had dried some during the night.

The great naturalist John Burroughs said: "Blessed is he whose youth was passed upon the farm and if it was a dairy farm, his memories will be all the more fragrant."

The drying weather was good for the third-cutting tests. The flailed material was baled at 2 p.m. of the second day. The crimped material wasn't ready until 24 hours later. The conven-

tionally treated hay wasn't ready for baling until about noon of the fourth day following cutting. The third cutting was light, and, in this case, turning the flailed material didn't have as great an effect on increasing the drying rate as expected.

Reduces Risks

From these tests, we can conclude that hay conditioning, if the harvesting procedure is properly managed, can reduce harvesting risks by eliminating one or more nights of exposure. Previous testing with conditioners has shown that—if the crop is cut after the heavy dew is gone, if the windrows aren't too heavy and if drying weather is good—conditioned hay can be baled the evening of the same day, thus avoiding any night-time exposure. But cutting later than 10-11 a.m. doesn't allow enough time for even conditioned hay to dry enough to be baled by evening. Then the hay must be exposed during the night and baled the following day.

Handling

Other states with similar weather patterns during the hay-drying season have reported getting the best cured hay when an operator cuts about as much green hay as he can safely handle in one day. Cutting the entire field at one time, on the other hand, increases the weather hazard.

The advantages of limited cuttings are obvious. (1) The operator has more control over the quality of his hay. The hay generally tends to be of more uniform quality since the time taken to cut each day's batch is short. In a large field cut all at once, the last hay baled often is much too dry, even though baling is started when the moisture content is just right. (2) If the mowed hay does get rained on, with limited cuttings, there's much less loss than if the entire field is mowed at one time.

A disadvantage is that the hay harvest can be extended beyond the time that the standing crop is at optimum maturity for highest-quality hay. Harvesting with limited cuttings, of course, isn't as efficient in terms of field operations as mowing the entire field at once. You must decide whether you want high-quality hay with some loss in operating efficiency or higher efficiency with a possible loss in hay quality.

A good hog manager who sets his goals and stays with them can average well above the break-even point in most years.

One other point is important if you use a flail harvester as a hay conditioner. Especially if you

place the hay directly into the windrow, take care that the tractor wheels don't run over any part of the windrow to cause packing. We found that, when this happens, only the uppermost layer of hay dries, while that below remains quite wet. Even turning the hay a half turn doesn't refluff the hay to its original state of looseness. When combining two or three swaths to make one windrow, it's necessary to straddle the windrow already made. To do this properly, we found that we had to spread the tractor wheels as far as possible.

Highlights

Our tests here at Iowa State and results elsewhere show that hay conditioners can give you better quality hay and decrease exposure risks if you follow the suggestions outlined about the time of mowing and conditioning. During good weather, conditioning can cut curing time almost in half. We've had reports from farm users stating that they've successfully made "hay in a day" under good drying conditions. But to do this, it's necessary to cut the material early in the morning to take advantage of full drying benefits.

If you're considering "hay in a day" harvesting, we'd suggest cutting only as much hay at one time as you can mow, turn or rake, bale and haul away in 1 day. But if, despite your best plans, the hay does get rained on, you've only a portion of your hay ruined.

The people with whom we've talked in conjunction with our tests and who are using hay conditioners are convinced that they pay for themselves in quality hay. With proper management, a hay conditioner can be a profitable investment.

Burning Crop Residue Destroys Plant Foods

The practice of burning cotton and corn stalks, crab grass and woodland cover has been compared to lighting cigarettes with dollar bills.

An acre of corn normally produces about two tons of stover which contains about 36 pounds of actual nitrogen. This is the equivalent of 225 pounds of nitrate of soda. When stalks and leaves are burned in the spring, valuable plant food goes up in smoke.

—North Carolina State College

Yearly Beef Cow Costs Figured

Agricultural economists at Virginia Polytechnic Institute have put together some interesting figures on how much it costs to keep a beef cow a year, says George Litton, head of animal husbandry.

Winter feed costs are put at $33, for 1½ tons of hay costing $22 per ton. Litton says this may not be representative for mountainous areas where in cold weather cows require more feed.

Summer feed is figured at $34, for 2 acres of pasture at $17 an acre. Pasture costs were figured as follows: fertilizer amounted to $6.30 per acre; interest at 6 percent on land valued at $100 an acre came to $6; fencing the land, clipping it, and spreading the fertilizer accounts for another $4.70, making a total of $17.

Litton says that 70 percent of total annual costs of keeping cows is in the feed and pasture charges. If total figures are available, it is easy to figure feed costs.

A charge for machinery and equipment is placed at $2 a year per cow. The cow is valued at $150, so interest and taxes on this amount come to $9. There is a charge for the bull that amounts to $5 per cow.

It has long been known, says Litton, that labor is one of the bigger miscellaneous items. The economists arrived at a figure of $8 for labor costs per year for one cow. A bedding and comfort charge of $1 was added.

Whether there are buildings or shelters, there are holding pens and chutes and lots and extra fencing and repairs for these, which may amount to $6 per cow per year. Another bill that can't be ignored is $3 for veterinary services and for testing, and medicine charges.

The total comes to $101 per cow per year, but a credit is allowed of $5 for manure. This brings the total figure down to $96.

Litton says, 'Applying these figures to the cattle business the last 14 years in Virginia, there would be five years of either breaking even or going in the red, and nine years of making a little money."

This depends, he adds, on the most efficient management and with close attention to calving percentage. If the calving percentage gets down to 83 percent, the cost of the calf will not be held to the present $96 figure, but would rise to $115.66. At this figure, cattlemen would have lost money in about half of the last 14 years.

Other items will affect profit in addition to the cost of keeping cows. Weight of the calf at market time is one of these other items. If each cow has a calf and the calves weigh 500 pounds, the break-even cost would be $19.20 per cwt. If they weighed only 400 pounds the break-even point would be $24 per cwt.

Letters to - Farmer's Digest

Our readers write many interesting letter to Farmer's Digest. Some relate personal opinions and may be quite controversial. Others tell personal experiences and problems and, perhaps, ask your advice. At any rate, we are sure these letters will interest you and, we hope, prompt you to write a reply or a letter on a subject of your own.

January 26, 1961

The Farmer's Digest
Mr. H Highsmith Publisher
Fort Atkinson, Wisconsin

Gentlemen:

It is the purpose of this open letter to acquaint you with a larger increase from your wheat crops by adopting a much needed revival of a lost and forgotten farm asset.

I refer to your wheat that can be cut, dried and threshed while green "with full kernels".

Modern soup canneries have deprived us of a valuable grain: "soup ingredient" green wheat, known as "green-kern" which is equal and I might say superior to lentel, rice, barley or bean.

Before the birth of canneries, soups were prepared by our mothers (experts) and they appreciated the value of the ingredients and green-kern was one of their favorites and could be purchased at any grocery.

In 1959 the approximate yield of wheat was one billion one hundred and twenty-eight million bushels and a good portion went in storage (surplus) and not one bushel of green wheat was produced.

Anticipating your qestion; where are the markets — my answer — hospitals, hotels, restaurants, soup manufacturers, health stores, breakfast food producers, and last but not least, government food depots.

The Department of Agriculture and your grange can approximate the division of ripe and green wheat for 1961 and they can guide you to information of a supervising group to handle publicity and methods of distribution.

My limited experience with farming (a hobby) and a good memory of green-kern soup has created a sincere desire to revive your interest in a product that can be enjoyed by all our citizens to increase your profit and to comply with our President's appeal — "Ask not what your Country can do for you — ask what you can do for your Country."

I have no other interest other than to help and I stand ready to further assist as called upon

Sincerely
Maximilian F Nirdlinger
Registered Architect
5593 Beverly Place
Pittsburgh 6, Pennsylvania

Pigs Gain Best With Ration Containing 0.7 Percent Calcium

Seven tenths of 1 percent of calcium in the ration of baby pigs between 2 and 6 weeks of age resulted in the best growth rate for the pigs, Researcher R. D. Zimmerman of Iowa State University told the American Society of Animal Production.

He said that in Iowa research with rations containing the equivalent of 25 percent dried skim milk, the pigs' growth rate was retarded when the calcium content of the ration got as high as 8 tenths of 1 percent of the total ration. But a ration containing only half of 1 percent lacked enough calcium for best growth. In come cases calcium levels above 0.7 percent not only reduced pig's growth rate but also reduced feed efficiency. —*American Society of Animal Production*

PRODUCTION COSTS — Keep your costs of production low, if you want to make money in 1961. You can achieve these low costs by using efficient management that gets more and better crops per acre with less land, labor, and time. Efficient management returns the most profits when it builds up all the factors that contribute to soil fertility. In such a program the use of fertilizer is an essential step.

Farm Management Tips That Will Help

Nine steps to keep your farm program "on the tracks" . . .

Condensed from The Country Guide

WANT to keep your farm program on the tracks during 1961?

Prof. A. C. Robertson, of the Ontario Agricultural College, says:

1. Quit paying inflation prices for land and buildings. Quit going to auction sales with bank money in your pocket; the auctioneer can spot this and sometimes bids against you.

2. Don't depend on what you hear at local auction sales and local meetings entirely. World-wide decisions are not made here, yet they may affect your business tomorrow.

3. Pay attention to your banker and farm management-finance man. If they know their business, they won't lead you up a blind alley.

4. There are lots of paying farms. Find out where they are, ask your agricultural representative to make up a little party and visit these farms in an organized fashion.

5. For goodness sake pay attention to: *soils and crops* — through the years what a man grew has been important. There have been times when you could buy income from the tail gate of a truck but not at present except in exceptional circumstances. Baby the livestock a little. This does not mean overfeed. Just a bit of care and common sense, and they will respond. Make pets out of them.

6. Of course, you need balancing feeds and other purchased feeds.

7. Draw a line down the middle of some page, probably a good many. Put assets and liabilities down. What's the surplus? Don't value that farm too highly. Then take a farm account book or make one up. Still only two col-

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The Country Guide, 1760 Ellice Avenue, Winnipeg 12, Manitoba, Canada

umns are absolutely necessary — receipts and expenses. Start at the first of the year and put down each item. Add them all up at the year's end. Have you got $3,000 to $2,500 or $2,000 for labor and interest in investment?

8. Get your banker to help you open a current account. Pay all bills by check. Of course, they will charge you, but it's cheap bookkeeping. Have a special savings or checking account for family living. Transfer (by check) money to the savings account for purchased food, clothes, children's education, etc.—anything that is not the farm's business.

9. Consult your family, your banker, your agricultural representative, your farm management and farm finance advisor frequently. If you tell a straight story, if your farm has a chance of providing a good standard of living these people will help you a lot. After all, your family is close to you; your banker makes his money by wise and judicious loans; your agricultural representative is a civil servant educated to assist; and your farm management-farm finance advisor knows what makes a paying farm.

Hardware Disease Livestock Ailment

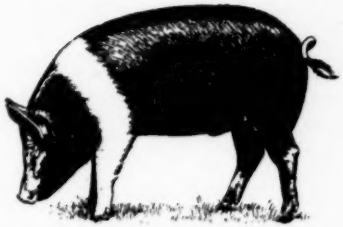
Farm animals, mainly cattle, pick up metal and other hard objects which may lead to a condition veterinarians refer to as "hardware disease." Small objects that are rounded do not cause much trouble —but sharp material, such as nails and bailing wire, can lead to real trouble. Sharp articles may penetrate beyond the stomach wall and injure any of the surrounding organs. The best prevention is to keep sharp objects, nails, wire, feed bag tag wires and similiar material picked up, kept from being mixed in with feed. Strong magnets can be used where necessary to pick up this material. Get the advice of a veterinarian when hardware disease is suspected.

—Louisiana State University

Farmers borrowed more money from the Federal Land Bank System last year than any time since the depression years of the mid-'30s. But where loans in 1933-34 were used to head off farm foreclosures, the borrowing last year was done by farmers buying additional land and modernizing their farms to make them more efficient units.

—A. I. Digest

Shrinkage In Marketing Hogs



Report on an experiment station test to determine why hogs shrink from 1 to 8 lbs. between farm and market . . .

Condensed from
The Feed Lot News

PURDUE University has recently made an extensive study of shrinkage losses in hogs between the farm and market. The study was made on nearly 300 loads of hogs (about 10,000 head) over a 17-month period. The hogs were weighed on trucks as close to the farm as possible, then again as they were unloaded from the truck at market.

Records were kept on the following:

1. Weights at the farm.
2. Weights at the market.
3. Distance to market.
4. Time in transit.
5. Weather conditions.
6. Conditions on the truck during shipment.

Shrinkage of hogs from farm to market may range between ½% to 4% — depending upon time and distance to market, temperature during shipment, and conditions during shipment.

Following are some of the factors which affect shrinkage:

A. Distance to Market

The greatest rate of shrinkage occurred during the first increment of distance and the rate gradually decreased with each additional increment of distance (shrinkage was less during the second mile than the first, less the third mile than the second, etc.) Following is the shrink from various distances:

Miles To Market	Shrink
35 or less	0.74%
36 - 65	1.37%
66 - 95	1.45%
Over 95	1.71%

B. Hours in Transit

Time in transit was a more reliable indicator of shrinkage than was distance. Here again, the greatest rate of shrinkage occurred during the first increment of time and the rate gradually decreased with each additional increment of time (shrinkage was less during the second hour than the first, and less during the third hour than the second, etc.). Following is the shrink during different times in transit:

Hours in Transit	Shrink
Up to 1 1/4	0.69%

1 1/4 to 3 1/3 .....1.32%
3 1/3 to 6 2/3 .....1.43%
Over 6 2/3 .....1.95%

C. Temperature during Transit

The optimum range in temperature to minimize shrinkage was between 20 and 60 degrees. The ranges between 0 to 20 degrees and 60 to 80 degrees were less desirable and greater shrink occurred here than between 20 and 60 degrees. The greatest shrink occurred when the temperature was over 80 degrees.

D. Conditions on the Truck During Transit

Shrinkage was held to a minimum when the hogs comfortably filled the area in the trucks (95% to 105% of recommended capacity). When filled to 75% of capacity or less, or 115% or more, shrinkage increased by more than 15%.

Conclusions

Shrinkage is always encountered when moving hogs from farm to market. Some factors affecting it can be controlled and others cannot be.

Coming New Weed Killers Promise To Control Pesky Quack Grass

A new weed-killing chemical not yet approved for use soon may have quack grass well under control, tests at Michigan State University indicate.

Dalapon is the chemical now most frequently recommended for quack grass control. However, it must be applied in the fall, which limits its effectiveness. If applied in the spring, the five week minimum waiting period makes the corn planting date too late in the season.

In Michigan tests, weed control scientists got the best results with the yet-to-be approved chemical which was plowed down in the spring. Corn planted as soon as 10 days after this treatment showed little, if any, damage from the chemical — amitrol-T. Residual effects and ultimate kill of quack grass will not be known until the experiments have run for at least another year or more. Then, recommendations for usage may be made. *Better Farming Methods*

Food is today the biggest industry in the United States. Sales of food by wholesalers, retails stores and restaurants now add up to some $70 billion yearly. The average value of food consumed in 1960, including that raised by farmers for home consumption, will be about $400 per person.

Feed For The Cow . . . Food For The Soil

Nature's 'factory' supplies good fertilizer . . .

Condensed from The Rural New Yorker

Firman E. Bear

FEED for the cow makes food for the soil. The manure produced from the feed is a more effective fertilizer than the feed itself would have been if applied directly to the soil.

Although only about 75 per cent of the fertilizer elements in the feed are recovered in the manure, these recovered portions are in a much more available form. And some of the organic by-products from the digestion of feed and its use by the cow have additional value to plants.

A farmer friend of my boyhood days had a hired man who, every time he walked down a lane separating two fields, scooped up any manure the animals had dropped and threw it across the fence. Within a few years, the crops just inside the fence were so much better than those farther back in the fields as to excite the curiosity of the neighbors who passed that way.

A workman at the West Virginia Agricultural Experiment Station accidentally applied cow manure to one of the no-treatment plots in a fertility experiment. This plot had not received any lime, manure or commercial fertilizer for the previous 15 years. Discovering his mistake later in the day, he carefully raked the manure off the plot and said nothing about it. But, as the season advanced, the much better growth of the crop on this plot than on the other no-treatment plots gave his secret away. A little manure goes a long way on a "worn-out" soil.

When driving through rural areas, one frequently sees remarkable effects on pastures from droppings of milk cows, particularly where the pastures have not been fertilized and where the cows are being well fed at the barn at night. The dosage of fertilizer, particularly nitrogen, is so high on these spots that the resulting greatly increased growth

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of forage does not have its usual sweet taste and the cows pass it by.

Some years ago, Holstein cows, weighing 1,300 pounds each, were put on a test for two 14-day periods. Each consumed 53½ pounds silage, 6½ pounds hay and 13½ pounds grain daily. And each cow produced 42 pounds milk and excreted 114 pounds manure per day. From this it was calculated that the yearly production of manure per cow, exclusive of bedding, would be nearly 21 tons. Each ton of the manure produced contained 9½ pounds nitrogen, three pounds phosphoric acid and eight pounds potash.

Nutrients Are Recovered

On the average, 70 per cent of nitrogen in the feed, 63 per cent of phosphoric acid and 86 per cent of the potash were recovered in the manure. The urine constituted 25 per cent of the total weight of manure, but it contained 50 per cent of the nitrogen and 84 per cent of the potash. Most of the phosphoric acid was in the feces.

In a similar test with Leghorn hens, 81 per cent of the nitrogen in the feed, 84 per cent of the phosphoric acid and 95 per cent of the potash were recovered in the manure. The feed consumed by 1,000 hens totaled 37½ tons per year and the manure they produced weighed, in its fresh state, 72 tons. Each ton of this manure contained 21 pounds nitrogen, 16 pounds phosphoric acid and 10 pounds potash. The hen manure was much higher in nitrogen and phosphoric acid than the cow manure.

Losses Likely To Occur

These values are for fresh manure as it is voided by cows and hens and without bedding or litter. But serious losses in fertilizer value are quite likely to occur between the time the manure is dropped and the time it reaches the field. The most difficult problem to solve with cow manure is that of preventing loss of the urine. With poultry manure the primary problem is that of preventing loss of ammonia into the air. Additional losses are suffered from all manures if they are exposed to the dissolving action of rain, which carries away not only the urine but also any soluble portions of the solid excreta.

Make plans now for your next pig crop. Select replacement gilts from February pigs, and locate and lineup meat type sire replacements.

The starting point in preserving the fertilizer values of manure is to use plenty of bedding or litter. Except when the ground is frozen or deeply covered with snow, the

ideal way of handling manure is to haul it to the field daily, working it into the soil immediately after application. This stops all losses, whether in liquid form by way of surface runoff during rains or in gaseous form into the air. Exposure of any kind of manure to the air—whether in the stall, barnyard or the field—results in some loss of ammonia, notably in warm weather. The best preventive for this, other than working the manure into the soil, is the daily application of about 50 pounds superphosphate per ton of manure as the manure is produced. Such supplementation with superphosphate greatly increases the crop-producing powers of manure.

In terms of its nitrogen, phosphoric acid and potash content alone, a ton of fresh cow manure has a value of about $2.00 and a ton of fresh hen manure $5.00. All the soil elements that were contained in the feed, including calcium, sulfur, magnesium, boron, molybdenum and many others are excreted in large part in the manure. And where manure is applied to the soil, it reactivates the soil microbes, which release not only the fertilizer elements in the manure for crop use but additional supplies from the soil itself as well.

Wet manures cannot be used to advantage except on the farms where they are produced or nearby. For this reason, large tonnages of wet manures are being dried for sale to town and city gardeners. Dried to about 15 per cent moisture, their ton values are multiplied by four, making cow manure worth, in fertilizer values, about $8.00 a ton and poultry manure $20 a ton. The other more obscure values in dried manure are not readily calculated. But when these dried manures are put up in moisture-proof 25- to 50-pound bags, they sell wholesale at about $40 a ton and retail at $75 to $80 a ton. Considerable interest has developed in pelleting manures to make them easier to handle. But this adds to production costs and selling prices.

One of the most troublesome problems in drying manures and in dealing with them afterward is that of controlling their offensive odors. On damp days, these odors are carried out long distances from the drying plants and near to the ground. They are also more noticeable in bagged manures on such days. Poultry and hog manures are particularly offensive, cow manures somewhat less, sheep manure least. Such odors can be controlled, in part, by returning escaping gases and recirculating them through a high-temperature burner. They can also be masked. Pelleting is of considerable help.

Chimney Smoke

by Irene Rudie

The beauty of the house is order;
The blessing of the house is contentment;
The glory of the house is hospitality;
The crown of the house is goodness.

—Fireplace motto

★ ★ ★

Imagine a squashed egg in a boy's overall pocket and the boy insisting that every item in the pocket has to be salvaged, rubber bands, bits of chain, small rocks, string, a folded note and assorted parts of a watch.

★ ★ ★

How simple life would be, if like the chickens, we would grow a new spring outfit to replace our shabby winter wardrobes! Like the oldest hen in the coop, we would be smooth and chic as any young pullet.

★ ★ ★

In this confusing language of ours a candidate for office who is said to have a fat chance and the one who has a slim chance are both in the same boat. Also, a man can be tight and on the loose at the same time.

★ ★ ★

Everyone admits that a girl should value advice from her mother when shopping for a new dress or suit, but the prevailiing idea seems to be that she needs no help except to follow her emotions when shopping for her life partner, the father of her children.

★ ★ ★

It has long been the custom of parents to combine two names for their daughters, Mary Lou, Julie Ann, and so on; but why don't we ever hear of names like Joe Pete or John Ole for the boys?

★ ★ ★

Fast disappearing from most farms is one of Spring's happiest pictures, a tiny child holding in his cupped hands that bright-eyed bit of yellow fluff that is a baby chick.

★ ★ ★

No matter what the government does or how prices rise or fall, we always have 100% of parity on uncluttered expanse of sunset and sunrise in true color, on high-fidelity birdsong, and daily miracles of unfolding leaf and flower.

New For You

BY THE EDITORS

When writing to manufacturers, please mention you saw their product in Farmer's Digest.

★ ★ ★

A new lightweight and easily portable, yet rugged power earth drill has been placed on the market by McCulloch Corporation, Los Angeles, manufacturer of power chain saws. The new gasoline-powered tool drills clean straight holes for fence building, soil testing, landscaping or any other hole drilling job. It can be purchased as a complete unit, or as a separate attachment designed to be converted in minutes to any McCulloch ONE/41 or ONE/51 standard chain saw.

For more information about this earth drill, write to McCulloch Corporation, 6101 West Century Boulevard, Los Angeles 45, California.

★ ★ ★

A new 625 gallon Jamesway Sani-Kool direct expansion, bulk milk cooler has been put on the market by the James Mfg. Co. This new Jamesway bulk tank is more compact, takes up less space, and yet has a large capacity which makes it ideal for small or limited size milkhouses.

It is all 18-8 stainless steel inside and out, features spiral jet cooling which speeds up cooling and cuts down on operating costs, and is designed for easy cleaning. This direct expansion tank meets all the new 3-A standards that went into effect September 1, 1960.

Any dairy farmer that is interested should send a postal card to the James Mfg. Co., Fort Atkinson, Wisconsin.

★ ★ ★

A new line of high capacity silo unloaders designed to provide vastly improved silage unloading convenience, is being revealed by the Patz Company. The line includes three standard sizes to accomodate silos ranging in diameter from 12 to 34 ft.

According to Patz officials, simple telescoping adjustments make it possible to buy a single unit for use in one, two, three or more silos. Moving the unit is completely practical since one man can assemble a new Patz Silo Unloader in one hour — take it apart in half that time.

For further information, see your local Patz Dealer, Patz District Representative, or write The Patz Company, Pound, Wisconsin.

New for 1961 is a complete line of high capacity forage blowers designed and manufactured by Kools Brothers, Inc. The Kools line includes three distinct models to satisfy any forage blowing requirement. Each retains all the proven features of earlier blower units, plus important new construction and operating innovations.

For more complete information concerning the three new Forage Blowers, write Kools Brothers, Inc., Appleton, Wisconsin.

★ ★ ★

The largest self-propelled combines ever produced — machines weighing nearly seven tons and utilizing 22-foot cutting platforms —are being put into production at the John Deere Harvester Works in East Moline, Ill., this winter.

The new combine, the John Deere 105, will permit one operator to increase his harvesting capacity more than 20 per cent above that possible with the largest combine previously available.

The cutting platform on the 105 is four feet wider than on the largest combines available up to this time. In addition, the cleaning and separating capacity, the power, and the grain tank have been increased roughly 25 per cent over the biggest machines previously available.

A new pull-type combine with the ability to harvest as many different crops as a self-propelled machine, has been also developed by John Deere engineers for diversified farmers whose operations don't justify investing in a self-propelled combine. The John Deere 42 can be equipped with a two-row corn attachment, making it possible to spread the investment in the pull-type machine over the same wide variety of crops as a self-propelled unit.

In the past, the use of corn attachments has been limited to self-propelled combines. Corn combining has been a rapidly growing farm practice since the mid-1950's when John Deere introduced the corn attachments for self-propelled combines.

An excellent way to keep from blowing your top is to keep an open mind.

Send a post card to Deere & Co., Moline, Illinois, for illustrated literature.

★ ★ ★

Automatic random handling of smaller bales is taking more of the time and work out of haymaking on many farms, and now there's a baler special-made to fit into the system. It's New Holland's Compact Hayliner 65, introduced in January.

The "65" is low, short and maneuverable, the same features that are proving so popular with many compact car buyers. And it makes a "compact", easy-to-handle 12-by-16-inch bale in any length from 14 to 48 inches.

Although well suited to average baling needs, the new Hayliner is designed mainly as a key machine in the growing trend to automatic, one-man haying. With Bale-Thrower, it is said will sell for no more than many balers alone.

New Tele-Flow feeding system in the Compact Hayliner 65 is designed for gentle, effective hay handling. Tines engage hay at the start of the stroke and sweep it into the bale chamber. A telescoping tine bar extends to measure against overload in heavy windrows. On the return stroke, the free-swinging tines move into a swept-back position.

Write to New Holland Machine Co., New Holland, Pennsylvania, for more information.

Antibiotics In Cattle Rations

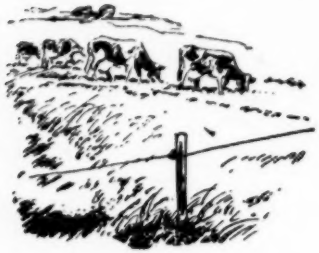
Use of antibiotics in cattle-feeding experiments has not produced results as consistent as those produced by use of stilbestrol or other hormone-like substances. However, in looking at the results of a number of experiments we can conclude that, in general, some favorable response has been obtained from feeding antibiotics to cattle on high-roughage rations during the winter. The results of an Illinois test reported below are rather typical of many in which antibiotics were fed to cattle under the same conditions. Steer calves receiving corn silage in a wintering ration were used in this trial.

	No antibiotic	Antibiotic
Daily gain, Pounds	1.63	1.86
Feed cost per 100-pound gain	$12.55	$11.33

On the other hand, Illinois tests have not shown any advantage for including antibiotics in fattening rations, particularly during the spring and summer months.

Some feeders feel that they have less trouble with foot rot when cattle get antibiotics. Seventy-five milligrams per head per day is the amount to feed. —*Illinois Timely Topics*

Change Gradually To Pasture Feeding



What conditions should be present before you turn them out? . . .

Condensed from Pennsylvania Farmer

R. S. Adams, Extension Dairy Specialist, Pennsylvania State University

THERE is little research evidence on the "best method" of getting cows on pasture feeding.

However, basic knowledge of rumen function and farm experiences indicate that the change-over from barn to pasture feeding should be made slowly.

Reasons

This gradual change in feeding practices appears necessary to keep excessive losses in bodyweight and delayed drop in milk production at a minimum. Part of the weight losses often associated with the start of pasturing can be accounted for by differences in rumen fill. In some cases, however, cows apparently are losing considerable flesh.

A drop in production will occur on some farms after cows have been on pasture three to six weeks. This may happen even though you maintain them on young, actively-growing forage. Sometimes production actually may have increased considerably at the start, but then decreased abruptly later in the pasture season.

The excessive weight loss and delayed drop in production probably stem largely from two factors. First, the cows may be suffering from lack of adequate dry matter and, consequently, nutrient intake. Early pasture, despite its high nutrient content on a dry matter basis, may contain as much as 0 to 88 per cent water. Thus, a 1,200-pound cow might have to eat as much as 180 pounds of pasture per day to obtain the same amount of nutrients in 36 pounds of hay-equivalent under good barn-feeding conditions. This intake of pasture approaches the maximum for cows under ideal conditions. They rarely eat over 15 per cent of their bodyweight daily in the form of green forage.

This lack of nutrients may be aggravated by refusal of some

Reprinted by permission from Pennsylvania Farmer, Harrisburg, Pennsylvania

cows to eat much, if any, grain or dry feed early in the pasture season. Moreover, the increased milk production, which may arise from unknown stimulating substances in early pasture, can add further to this short-changing of the cow. Is it any wonder that some cows lose flesh on pasture or eventually drop in production?

A second factor is the period which may be necessary for rumen microorganisms to adjust to a major change in ration. This can require two to four weeks. During this period the digestive processes of the cow may not be functioning normally and she may be under more stress. Recent research suggests that some changes in ration (type of forage and ratio of forage to grain) may stress a cow more than a shortage of nutrients. Thus, it seems important to maintain some semblance of our barn-feeding program during the early stages of pasturing.

A gradual shift in ration also helps to prevent milk rejections due to pasture or weed flavors. Possibly this problem may be associated with the use of body flesh to produce milk, as well as forage consumed.

For some the pasture season begins as soon as the supply of hay or silage is exhausted. This means that you should plan a sounder forage program—one that will provide you with a "cushion" of forage to use in converting to pasture and for supplementary feeding.

From the standpoint of maintaining your improved pastures, grasses should not be grazed until they are five to six inches tall and legume-grass mixtures eight to ten inches high. When rye or wheat is available for pasturing. an earlier start can be made. Some dairymen are successfully pasturing their cows nine months of the year by using these crops.

All Elements Must be Considered

Weather conditions and especially ground temperatures also must be considered in launching the pasture season. This is particularly true in mastitis prevention and deciding when to leave the cows out at night.

For the average cow, 25 pounds of good quality hay is enough. If you only have low quality hay, add one pound of protein meal daily.

Turn cows out for only one to two hours during the first several days. Then increase grazing time gradually until the cows are on full-pasture feeding at the end of 10 to 14 days.

Hay or silage feeding should not be discontinued altogether until the cows have been on full-pasture feeding for about two

weeks, or nearly a month from the start of pasturing. Since silage and green forage are both high-moisture feeds, it might be best to reduce and end silage feeding before hay. This might not apply, however, if the cows did not eat as much dry matter from hay as from silage.

Do not decrease the amounts of grain fed or the protein content of the grain mix until about one month after pasturing commences. When the cows refuse to eat fair amounts of roughage or grain, it might pay to limit grazing times more severely for several weeks. Splitting grain allowances into three feedings during the early pasture season might be helpful. The extra feeding may be fed in the evening when cows are out during most of the day.

More and more dairymen now are feeding hay or silage or both during the pasture season. This is largely insurance against nutrient shortages and fluctuating production. When legumes are pastured it is important to feed coarse roughage, such as hay, to help prevent bloat.

Some dairy farmers feed grain at the same rate throughout the year. Others feed less grain while cows are on good pasture. A few are feeding all cows four to six pounds of grain daily on good pasture and obtaining satisfactory results.

A "heavy" grain mix should be maintained during the pasture season. Contrary to common belief a "heavy" mix is a cooler feed than a high-fiber grain mixture. Less work of digestion results on a low-fiber feed. In addition, the low-fiber mix will not aggravate the loose-bowel condition frequently encountered early in the season.

The extent to which savings in grain feeding can be made on pasture will depend greatly on the ability of the feeder to watch

Swine specialists say that a good boar is cheap at any price

production and flesh on his cows, and his pasture management practices. Forage is better utilized when some grain is kept in the ration.

Milk Rejections

Rejections due to pasture or weed flavors and odors can be costly, especially in this era of the bulk tank and in some cases every-other-day p i c k - u p . The gradual introduction of cows to pasture as detailed above will help prevent this problem. Most important of all, cows should be removed from pasture at least three hours before milking, for about two weeks after grazing begins. This is particularly necessary in the case of rye pasture.

Pastures infested with flavor-tainting weeds should be reserved for young stock or dry cows whenever possible. If you must graze milking animals on fields containing garlic, onion, bitter-sweet, honeysuckle or dogs-fennel, remove them at least six hours prior to milking. This applies to green-feeding as well.

Changes in Production

Sometimes a lot can be learned from observing what happens to production when cows are turned out to pasture in the spring. When a sharp increase in production is noted, this may be an indication that your barn feeding practices need improvement.

If production decreases appreciably you may not be doing an adequate job of changing to pasture feeding, or the nutrient intake of your cows on barn feeding exceeds consumption on pasture. Ideally very little change in production should be noted when barn feeding ends.

Englishman Says Cut-the-Corners Farming in U.S.A. is Sound Business

(Editor's Note: Oh, to see ourselves as others see us.)

Straight furrows don't matter in U.S. farming because time is so important and labor so expensive, Mr. Basil Ambrose told the Stanningfield (England) Agricultural Club. Newly returned from America after a 16,000-mile study tour, he defended our system of cut-the-corners farming as not laziness but sound business so far as we are concerned.

"American farming is relatively poor husbandry and the American farmer is better as an engineer. He doesn't worry about people looking over the fence and his standard of success is a new car every year."

Other American business principles could be summarized as:—

- Judging optimum size of farm by "what the family can do."
- Deciding rotations to give a sequence of harvests during the year rather than by concern for soil husbandry.
- Growing many crops—even sugar beets—in 42" rows because farm equipment is geared for corn-growing in 42" rows.
- Spraying only to "stunt" weed instead of kill.

"They never look for perfection in anything," commented Mr. Ambrose, "they don't think it is worth it. But they work hard and think they are getting behind if they don't drill 100 acres a day per man."

—Farmer & Stock-Breeder

Is This Feed Safe, Boss?

Pesticides in our feed troughs are threatening your milk markets . . .

Condensed from Kentucky Farmer

IF YOUR dairy cattle seem to be looking at you with a questioning eye, maybe they are worried about the pressing problem of milk contamination through improper use of pesticides. Mis-use of pesticides pose a real threat to the markets of dairymen!

Federal and private organizations have been testing milk and milk products and have been finding pesticide and antibiotic residues in milk. Some milk products have been seized at a monetary loss to processors and their producers.

The real threat behind these seizures is that the bad publicity accompanying these seizures hurt the consumer confidence in milk and dairy food, with a resulting bad effect on sales—and this comes at a time when milk producers are contributing to organizations in an effort to increase sales.

At the present time there is a zero tolerance for pesticide as well as antibiotic residues in milk and milk products. This means that if any trace of pesticides or antibiotics are found in milk or milk products they can be seized and condemned. In addition, a farmer's herd can be quarantined until the contamination is corrected.

Pesticides bring up a different and much more difficult problem than antibiotics, such as penicillin. Pesticide residues enter milk in several different ways, among these being: (1) from direct contact with contaminated utensils; (2) from the cow. If directly exposed to sprays or other means, or through the feed she consumes, the cow will give milk that is contaminated. And (3) through the use of fly or insecticide sprays on animals and barns where the spray may contaminate the milk.

Contamination is hard to avoid. For example, a farmer can spray DDT on a field for insects or the state can spray an area for mosquitoes. When a rain comes,

Reprinted by permission from Kentucky Farmer, Box 210, Middletown, Kentucky

the run-off may drain into a pond used to water dairy cows. When cows drink the water, they take up the pesticide. Pesticides such as DDT then lodge in the fat of animals and remain for long periods of time before they stop giving off traces.

Your local milk plants can't run tests for pesticides like they can for antibiotics. The tests for pesticides are difficult, very expensive, and practically impossible to run routinely in the dairy plant. For this reason, the burden for "clean" milk falls back to the farmer doing every thing he can to make sure his milk is not contaminated.

Some basic rules for dairymen were recently released by the Dairy Industry Committee, Office of the Secretary of Agriculture, Washington, D. C. These rules provide a simple step-by-step procedure to avoid contamination from pesticides. These Do's and Dont's are:

FOR BARN SPRAYS—on wall or ceiling, the use of diazinon, korlan, or malathion is recommended. *Do not use* DDT, lindane, chlordane, and other insecticides.

FOR CATTLE SPRAYS—use the pyrethrins plus piperonyl butoxide. *Don't use* methoxychlor, DDT, lindane, malathion, chlordane, and related compounds.

FOR THE MILK HOUSE—on outside walls spray with "barn sprays." Inside the milk house use recommended "cattle sprays" if needed. *Avoid contamination* of utensils, cans, tanks, etc., when spraying. *Do not use* scatter bait or "barn sprays" inside the milk house.

FOR HORN FLIES—USDA recommends sprinkling the back and neck of the animals every three weeks with methoxychlor powder, or dusting with malathion. *Do not dust* with malathion within five hours of milking.

CANNERY WASTE—*Do not feed* these materials unless you can be sure they do not contain residues which will carry through into the milk. Such products have frequently been found to contain high concentrations of pesticide residues.

More than 75 per cent of the counties in the U. S. are taking part in the USDA brucellosis eradication program.

FORAGE—Pastures and crops used for forage and roughage feeds are frequently treated with pesticides. Extreme caution should be used and label directions followed exactly when using these compounds. Pay particular

attention to the time sprays are applied.

Certain s a f e t y restrictions should be used after applying insecticides.

A. *Do not allow* dairy animals to graze on fields treated with DDT, toxaphene, chlordane, aldin, dieldrin, or heptachlor.

B. *Do not feed* dairy animals plants that have been treated with DDT, dieldrin, aldrin, chlordane, toxaphene, heptachlor, sevin, or aramite.

C. *Do not feed* dairy animals forage, or crops used for that purpose, that has been treated with aldrin, chlordane, DDT, dieldrin, toxaphene, and endrin. A 45-day period must have passed since spraying with endrin!

D. *Do not feed* dairy animals ensilage made from plants which have been treated with DDT, dieldrin, aldrin, chlordane, toxaphene, or heptachlor.

The four *don'ts* listed above do not tell you how to apply the pesticide appropriate to control any particular insect. To be sure you are using any pesticide properly on a crop, an animal, or as a barn spray, follow label directions and restrictions exactly. For added information or explanations, contact your County Agent or local dealer.

Recent action by the Federal Food and Drug Administration calls for label statements on drugs telling farmers they are required to discard milk for the 96-hour period after dosage or for whatever shorter period is necessary to free the milk of traces of the drug. A previous regulation still in force requires similar labeling for udder-infusion antibiotics and drugs.

Another good *don't* is—*don't use* pesticides or drugs that have been sitting on a shelf for several years. Information on the label is not up to date and properties of the chemical may have changed over the years.

The success of this battle is up to the dairy farmers of the entire nation. Is *your* milk "clean"?

Enzymes Fail To Increase Gains On Fattening Lambs

Adding crude enzyme preparations to dry corn rations for fattening lambs failed to improve feed consumption, rate of gain or feed conversion in Iowa State University experiments, Researcher Brent Theuer has reported.

The enzymes used were agrozyme and ficin. Theuer said study of the enzymes in an artificial rumen showed they lost most of their protein-digestion activity within 2 or 3 hours in the artificial rumen.

—*Iowa State University*

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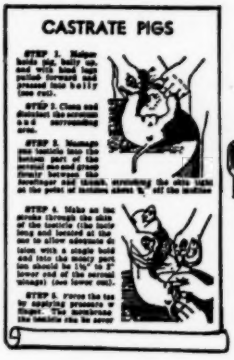

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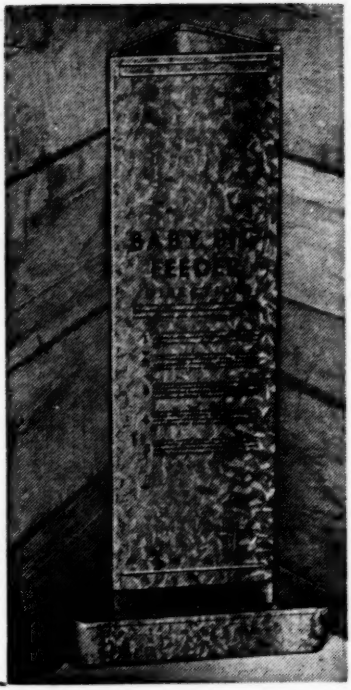

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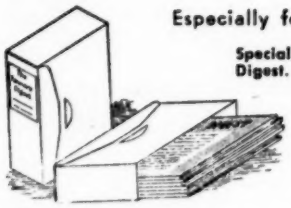

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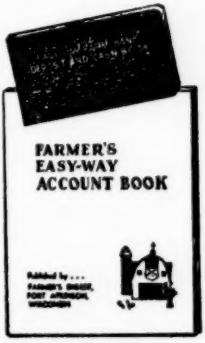

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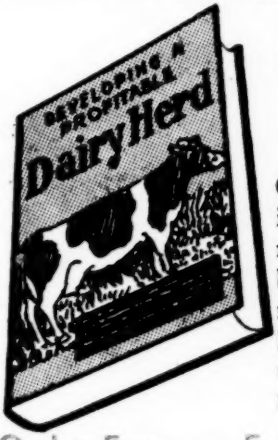

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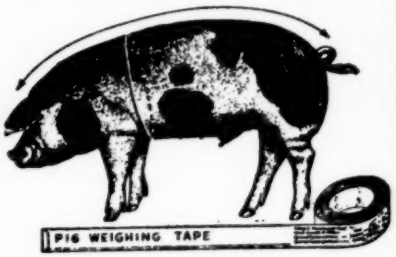

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